RESEARCH NOTE 83-43

SURVEY OF CURRENT DOCTRINE, TRAINING, AND SPECIAL CONSIDERATIONS FOR MILITARY OPERATIONS ON URBANIZED TERRAIN (MOUT)

David W. Reiss
Mary N. Perkins
Kenneth L. Evans
Leslie H. McFarling
Larry B. Nadler
Mellonics Systems Development Division
Litton Systems, Inc.

and

Thomas J. Thompson
U. S. Army Research Institute

Submitted by
Seward Smith, Chief
ARI FIELD UNIT AT FORT BENNING, GEORGIA

and

Jerrold M. Levine, Director
SYSTEMS RESEARCH LABORATORY

U. S. Army

Research Institute for the Behavioral and Social Sciences

November 1983

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: Research Note 83-43	2. GOVT ACCESSION NO.: AD-A136 F33
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle): SURVEY OF CURRENT DOCTRINE, TRAINING, AND SPECIAL CONSIDERATIONS FOR MILITARY OPERATIONS ON URBANIZED TERRAIN (MOUT)	5. TYPE OF REPORT & PERIOD COVERED: Final Oct 82-Apr 83
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): David W. Reiss, Leslie H. McFarling, Mary N. Perkins, Larry B. Nadler, Kenneth L. Evans, *Thomas J. Thompson	8. CONTRACT OR GRANT NUMBER(s): MDA 903-80-C-0345
9. PERFORMING ORGANIZATION NAME AND ADDRESS: Mellonics Systems Development Division, Litton Systems, P. O. Box 2498, Fort Benning, GA 31905	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: 2Q162717A790, WU #234801
11. CONTROLLING OFFICE NAME AND ADDRESS: *U.S. Army Research Institute for the Behavioral and Social Sciences, Fort Benning Field Unit, Fort Benning, GA 31905	12. REPORT DATE: November 1983
	13. NUMBER OF PAGES: 119
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	15. SECURITY CLASS. (of this report): Unclassified
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

The Contracting Officer's Representative was Seward Smith.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

military operations on urbanized terrain (MOUT)

Accession For
NTIS GRA&I ☑
DTIC TAB ☐
Unannounced ☐
Justification
By
Distribution/
Availability Codes
Dist | Avail and/or Special
A-1

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The authors have determined that numerous researchable problems exist in the MOUT area; most notable are: (1) there is a need for an updated doctrinal review; (2) an optimum [illegible]p scale for MOUT operations needs to be determined; (3) incorporation of live fire training should be explored; (4) urban terrain analysis needs more emphasis; (5) a detailed task analysis of MOUT needs to be conducted; (6) the use of Multiple Integrated Laser Engagement System (MILES) equipment should be expanded; (7) the role of snipers needs to be more closely

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Item 20

Abstract (cont'd)

examined; (8) the need exists for developing command post and field MOUT scenarios; (9) related training without the use of a MOUT facility needs identification and emphasis; (10) weapons which are suitable for MOUT need to be identified; (11) the equipment needs of the individual soldier should be evaluated; and (12) the use of simulation may be a cost-effective alternative training method.

ACKNOWLEDGEMENTS

The present research was conducted under the monitorship of Mr. Hal Strasel, ARI Field Unit, Fort Benning, Georgia, and under the cognizance of Dr. Edward W. Youngling, Mellonics Systems Development Division of Litton Systems, Inc., Project Manager, Fort Benning, Georgia.

SURVEY OF CURRENT DOCTRINE, TRAINING, AND SPECIAL CONSIDERATIONS FOR MILITARY OPERATIONS ON URBANIZED TERRAIN (MOUT)

EXECUTIVE SUMMARY

Requirement:

The continued growth of urbanized areas throughout the world, especially in Western Europe, has focused increasing military emphasis on fighting in, around, and through urbanized areas. Planning and conducting operations in an urbanized environment requires unique training and planning procedures.

Procedure:

The authors of this report conducted a review of all existing U.S. MOUT doctrine and observed training in both the institutional and unit environments. Questionnaires were administered to entry level U.S. soldiers, and interviews were conducted for all grades within the Army. Of special interest is the comparison of MOUT training and doctrine made between the U.S. and its allies (West Germany, England, and France).

Findings:

The authors have determined that numerous researchable problems exist in the MOUT area; most notable are: (1) there is a need for an updated doctrinal review; (2) an optimum map scale for MOUT operations needs to be determined; (3) incorporation of live fire training should be explored; (4) urban terrain analysis needs more emphasis; (5) a detailed task analysis of MOUT needs to be conducted; (6) the use of Multiple Integrated Laser Engagement System (MILES) equipment should be expanded; (7) the role of snipers needs to be more closely examined; (8) the need exists for developing Command Post Exercise/Field Training Exercise (CPX/FTX) MOUT scenarios; (9) related training without the use of a MOUT facility needs identification and emphasis; (10) weapons which are suitable for MOUT need to be identified; (11) the equipment needs of the individual soldier should be evaluated; and (12) the use of simulation may be a cost-effective alternative training method.

Utilization of Findings:

The purpose of this report is to give an overall view of existing MOUT doctrine and training. It can form the basis for a specific research project, or a change to current training procedures.

SURVEY OF CURRENT I CTRINE, TRAINING, AND SPECIAL CONSIDERATIONS FOR MILITARY OPERATIONS ON URBANIZED TERRAIN (MOUT)

CONTENTS

CONTENTS continued

LIST OF TABLES

LIST OF FIGURES

SURVEY OF CURRENT DOCTRINE, TRAINING, AND SPECIAL CONSIDERATIONS FOR MILITARY OPERATIONS ON URBANIZED TERRAIN (MOUT)

INTRODUCTION

This report summarizes the findings of a survey of doctrinal, training, and special considerations (e.g., weapons, equipment, etc.) related to the conduct of Military Operations on Urbanized Terrain (MOUT). The report will be provided to the U.S. Army Infantry Center (USAIC) and the U.S. Army Infantry School (USAIS) for their consideration and use in further training developments for MOUT.

The term MOUT is of relatively recent coinage. It was defined to emphasize the broader aspects of combat in generally urbanized terrain, including large cities, strip cities, medium-sized towns, villages, and hamlets; all within the context of the surrounding open country. MOUT concepts call for fighting the total battle; fighting around and through cities and towns only as required by the strategic plan and the developing tactical situation. MOUT is conceived as including, but broadening, the concepts of Military Operations in Built-up Areas (MOBA) and Combat in Cities (CIC), terms which were formerly used to define less extensive concepts. While this survey is attuned to the broader concepts of MOUT, it concentrates mainly on the mission of infantry and the requirements for individuals, squads, and platoons to perform their basic missions in the context of MOUT. Thus, this report concentrates mainly on the requirements and needs of small infantry units in operation on urban terrain and within the city/town environment.

The report is organized into three major sections. This INTRODUCTION section gives a general background of MOUT and describes the demographic growth of Western Europe since World War II. The SURVEY OF CURRENT MOUT TRAINING section discusses the major factors influencing MOUT planning, preparations and training. The CONCLUSION AND RECOMMENDATIONS section summarizes the major points of discussion in the body of the text and identifies a set of suggested areas for further research and development related to MOUT training developments.

This survey was intended to develop a clear and concise view of where the U.S. Army is currently, and where it should be heading, with respect to doctrine, training, and other special considerations related to planning for and conducting MOUT. This report summarizes the current status of these considerations as observed in the literature and in field observations of training activities of the U.S. Army, and of elements of the West German and British Armies.

Method

A limited survey methodology was followed throughout the research. A variety of activities were required to accomplish the survey. These activities include a continuing review of the current state of knowledge through review of all pertinent literature, and through close coordination with other agencies concerned with MOUT.

The survey was begun by reviewing all Army doctrinal and training literature as well as many non-military publications which were found to be relevant to the considerations at hand. These documents included scientific studies, historical perspectives, and current think-pieces on the subject. All relevant data sources were searched to assure our coverage would be as complete as possible. Several unique bibliographies were used as starting points for the research, including two from the U.S. Army Human Engineering Laboratory (HEL) and the TRADOC Systems Analysis Activity (TRASANA).

Following the initial review of military doctrine and training manuals, a series of observations of institutional and unit training were conducted to determine what was being trained and how. Observations included all institutional courses taught by the USAIS which present instruction on MOUT. These are: the One Station Unit Training (OSUT) for initial entry trainees; the Advanced Non-Commissioned Officer's Course (ANCOC); the Basic and Advanced Infantry Officer's Courses (IOBC and IOAC); and, the Infantry Pre-Command Course (IPCC) for new battalion and brigade commanders. These courses were monitored by staff personnel on multiple occasions. Semi-structured interviews were used to elicit information on prior MOUT training and experience from both trainees and instructors in the courses. Observations were then scheduled and conducted in units. Visits were made to U.S. Army Forces Command (FORSCOM) units at Fort Benning, Georgia and Fort Campbell, Kentucky, as well as to U.S. Army Europe (USAREUR), including the Berlin Brigade. Questionnaires and interviews were used during these field observations in order to elicit data on training and current practice While in Europe, the West German Infantry School at Hammelberg was visited to observe unit MOUT training by both West German and American troop units. In addition, British and French MOUT training doctrine and techniques were discussed with appropriate authorities.

Demographic Perspective

The importance of MOUT is becoming increasingly evident as a determinant of overall military success. In World War II, 40% of the fighting in Western Europe between allied and Axis forces occurred in urban areas (U.S. Army Science Board Ad Hoc Group, 1978). Europe has grown to encompass 567 cities with populations in excess of 100,000 people, combat on urban terrain appears more and more certain. Unfortunately, doctrine has traditionally shunned combat in cities, and the Army has offered little training for urban warfare. The U.S. Army Science Board Ad Hoc Group (1978) has noted that "in all three areas--doctrine, training, and materiel--the Army's capability to fight effectively in cities is less than it needs to be" (p. v).

Will the majority of battles in the next conflict involve MOUT? If the conflict occurs in Europe, the answer is definitely "yes." However, to this answer one may also add, "and no." The reason for the cautiousness is that although a majority of the Army's training and tactics are directed toward a European conflict, the specific area in which most of the battles will be fought is sadly neglected in the total training picture; this area is MOUT. Which unit, other than the Berlin Brigade, is trained for attacking or defending a city the size of Frankfurt, Nurenburg, Munich, Stuttgart, or any other large western European city? Unfortunately, the answer is, "none."

Looking at a map of modern Europe, one will find that the demographic growth of cities and towns has produced a "super city." The "super city" in Germany extends from Hamburg in the north, and continues in a crescent through the Ruhr valley, down the Rhein and Danube valleys to Munich in the south. The "super city" extends east to west, from the Belgian and French borders, to within 25 miles of the East German/Czechoslavakian borders. Within the "super city," an area of approximately 45,000 square miles, live 75% of the 62 million West German people. Some of the principal cities within the "super city" include:

City	Population	City	Population
Bonn	510,000	Hannover	845,000
Bremen	820,000	Mannheim	1,270,000
Dortmund	632,000	Munich	1,895,000
Dusseldorf	1,135,000	Nurenburg	855,000
Essen	5,?75,000	Stuttgart	1,655,000
Frankfurt	1,685,000	Wuppertal	920,000
Hamburg	2,300,000		

(Rand McNally, 1981)

Consider a country the size of Wyoming with population of 62 million and with 45 million people living in only one half of the state. Another perspective is that if one could take all of the people in California, New York, Pensylvania, Ohio, and Georgia, and move them to Wyoming, then you would have the same approximate population density as West Germany today. Yet another perspective is that the current population density of 647 persons per square mile living in West Germany is very close to that of a U.S. battalion, on line under current doctrine.

What does all this mean to a conflict in Western Europe, especially West Germany? It means that in the limited maneuvering space available, the cities, towns, villages, and hamlets of the "super city" will become the crucible of the war. After the maneuvering is completed, fighting should occur in the cities. An excellent analogy involves Russia during World War II. The invading Germans maneuvered and won tremendous battles in the open areas, but the end began when they confronted stubborn defenses at Leningrad and Stalingrad (Fuller, 1956). These two cities, 1,000 miles apart, became the anchors at either end of a tenuous line that permitted the Russians to begin the massive counterattack that was the "beginning of the end" for the German Army. Because of their strategic importance as industrial and communications centers these cities could not be avoided or bypassed. The same situation exists in West Germany today, with cities such as Frankfurt, Hamburg, Munich, Stuttgart, Essen, or Mannheim. The defense of these and other cities is going to be the key to winning a conflict in Western Europe. Fuller (1956) mentions that it took the armies of the U.S., Great Britain, and their allies eleven months to move the 500 miles from Normandy to Nurenburg. During this painfully slow advance, 40% of the fighting occurred in cities and towns (U.S. Army Science Board Ad Hoc Group, 1978).

Characteristics of MOUT

Special Text 90-10 (USAIS, 1979) indicates that "the nature of the urbanized terrain can...limit the effectiveness of weapons, vehicles, and other equipment" (p. 21). A quotation from Adolph Hitler in 1939 shows the concern he had for armored vehicles in towns: "Under no circumstances must the tanks be permitted to become entangled in the endless confusion of the rows of houses in the Belgian towns" (Fuller, 1956, p. 404). Further, MOUT introduces unique problems to conventional methods for detecting, locating, and identifying forces. Many methods require line-of-sight, but open areas rarely exist and the enemy is readily concealed in MOUT (U.S. Army Science Board Ad Hoc Group, 1978). In this latter respect, MOUT typically entails a tremendous advantage for the defender, such that the attacker requires eight or nine times more manpower for operational equality. Jureidini, McLaurin, and Price (1979) offer strong support for this contention, citing the Christian-Syrian fight in Lebanon as an illustration of the benefits which accrue to the defense in urban combat.

This may lead one to conclude that in MOUT the "best offense is a strong defense", to paraphrase a popular sports idiom. By making it impossible strategically or tactically to bypass an urban area, the enemy's advance may be slowed down and brought to a complete halt. The defense of, and counter-attack from, a city is much different than defending in open terrain. The opposing forces will be dismounted due to the confines of the city. The mobility of attacking tanks or armored vehicles will be severely limited in the streets and alleys of modern cities. Such simple things as Molotov cocktails dropped from upper story windows may impede or stop any armored vehicle. Vehicles will be canalized into narrow streets, their mobility and observation limited, and will become easy targets for the defender. The rubble caused by the battle may provide better anti-armor defenses than a unit could construct. The advantages of cover, concealment, and knowledge of the terrain will be with the defender. As mentioned previously, the attacking force will need eight or nine times the number of defenders to successfully defeat a well-planned, organized, and imaginative MOUT defense.

In addition to a defensive advantage, many other features distinguish MOUT from open-area fighting. Guthrie (cited in Schecter, 1977) attributes the following unique characteristics to urban environments:

1. defender concealment and protection,
2. structures above and below ground level,
3. shorter range of engagement,
4. communications interference,
5. command, control, and surveillance obstructions, and
6. collateral damage constraints.

Other MOUT experts have made similar observations regarding the nature of combat in cities and have stressed the need for training to contend with these features. The U.S. Army Science Board Ad Hoc Group (1978), for example, asserts that "communication is essential to command and control. The present communication capabilities under MOUT conditions are inadequate" (p. 63). The Board also enumerates various MOUT characteristics with important psychological implications. These characteristics include:

1. close-range combat in all directions,
2. fire from snipers,
3. limited direct observation,
4. unreliability of normal communication channels,
5. intense fighting which occurs with little warning,
6. inadequacy of maps, which renders orientation more difficult,
7. action occuring at the small-unit level,
8. necessity for tactics and weapons usage to be suited to local conditions,
9. decentralization of plan execution,
10. reduced use of combined arms support,
11. extensive combat periods,
12. night fighting,
13. difficulty of resupply,
14. presence of civilian personnel, and
15. reduced medical support.

Clearly, these characteristics must be considered in designing MOUT training courses. As such, the next section provides a general discussion of training issues pertinent to MOUT.

Requirements for MOUT Training

As noted earlier, U.S. Army doctrine advocating the bypassing of cities has, until recently, diverted attention from MOUT training. Unless more training priority is given to MOUT, the first time that most of our leaders and soldiers will plan and conduct a defense in a large urban area will be under wartime conditions. This situation could have disasterous results.

Cronin (cited in Thein, 1978) cites the inadequacy of MOUT training facilities Army-wide. Still, MOUT training and research efforts are progressing at various locations, including the USAIS and HEL. Ellefsen, Carlson, Tehin, Milligan, Lein, and Kanemoto (1981) report that "recognition of the need to know the opportunities and constraints posed by the urban environment has led further to an expression of interest in giving training of the significant characteristics of the urban terrain to appropriate military units, especially infantry" (p. 3). A. M. Gray, Jr. (1980), however, cautions that "doctrine and tactics are pretty good--but the training, the preparedness, and the ability to execute, leave a lot to be desired" (p. 3). As indicated, the preparedness conferred by MOUT training must entail skill acquisition and psychological readiness. Gale (cited in Thein, 1978), contending that MOUT training must reduce the stress associated with urban combat, supports this position. The U.S. Army Science Board Ad Hoc Group (1978) also acknowledges this dual training function, asserting that "psychological factors are considered much more important in MOBA training than in other types of warfare" (p. 22).

In order to develop necessary skills and psychological readiness, MOUT training must be as realistic as possible, within economic and safety constraints. Many MOUT experts offer strong support for this viewpoint. For instance, Weisz (1980) posits that "no village fighting course should be designed and built without using live fire " (p. 58). Further, Barrow (cited in Thein, 1978) advocates "having troops in training wear body armor and equipment they will be using in combat" (p. 42). Finally, Jureidini et al. (1979) report that their findings "reaffirm the importance of exhaustive and realistic training for MOBA" (p. 56).

The design and implementation of realistic MOUT training must incorporate the multitude of variables found in urban warfare. For example, the nature of urban buildings warrants consideration in MOUT training. According to Ellefsen et al. (1981), "The U.S. Army has a need to view urban buildings as providing certain opportunities for defense of a city while recognizing that there are certain constraints which buildings impose on operations" (p. 23). Further, they maintain that principles of types of construction and the configuration of interior space are universally applicable and can be employed to the Army's advantage. Specifically, Ellefsen et al. (1981) state that "the ability for troops in combat in an urban situation to identify the types of buildings they encounter could well be vital for their own survival and for the success of the mission" (p. 28). As a result, these researchers designed, implemented, and evaluated a program for training how to develop and tactically use the information inherent in the proper identification of building type. They distinguish between mass and framed support systems, which differ in terms of load capacity and distribution of weight. Proper determination of building construction can directly affect tactical decisions, the selection of defensive positions, and choices concerning weapons deployment. The study's results are encouraging, in that Ellefsen et al. (1981) state that based upon administered training, participants "were able to relate their previous knowledge of tactics and weapons to their new understanding of the nature of the city as a potential site for military operations" (p. 8). Stone (1980) also realizes the utility of

training for acquainting personnel with features critical to the outcome of urban combat. He recommends leadership training at the company or battalion level, to recognize the tactical military value of buildings by correctly categorizing physical exterior characteristics.

Other MOUT experts stress the importance of familiarization with urban terrain for military success. Hayes (1980) advocates using videodisc technology to simulate a map of a given urban area, with branching occuring to depict different climatic conditions, perspectives, and day versus night situations. The U.S. Army Science Board Ad Hoc Group (1978) also realizes the importance of mapping, asserting that "planning and preparation for MOBA would appear to be more important to an effective city defense than new and original concepts" (p. 22). They believe that detailed urban maps should denote transportation routes, communication systems, underground installations, and key governmental centers. In a related manner, Ellefsen et al. (1981) recommend that small-unit leaders conduct terrain analysis via walk-through exercises. Clearly, urban mapping must assume a central role in MOUT training.

In addition to familiarization with urban terrain, some MOUT researchers focus upon organizational and tactical training considerations. At a general level, A. M. Gray, Jr. (1980) discusses requirements for Ground Combat Element (GCE) and Aviation Combat Element (ACE) training. In GCE, he believes that combined arms training is needed, while ACE necessitates training aviators to orient themselves in an urban environment. Also, exploring coordination requirements, Jureidini et al. (1979) note that communication problems can be eliminated by decentralization of command, which reduces the need for extensive contact. Although these researchers do not specifically discuss training, the implications of their observation for developing MOUT readiness are apparent. Rigby (1980) describes the following training situation that would be practiced by MOUT troops:

1. town layout - learning movement across junctions, fire positions, gap crossing, and mutual support,

2. marksman under fire - firing at targets while receiving retaliatory fire,

3. urban close quarter battle - acquiring command and control shooting skills and alertness, and

4. fire discipline - identifying and engaging the enemy while not harming civilians (i.e., quick differentiation).

Personal experience of the senior author (a Company Commander in Hue, during the Tet Offensive of 1968) led him to conclude that the U.S. Army was woefully unprepared for fighting in urban areas. His company was not trained for urban fighting and they suffered over 50% casualties in a three-week period of fighting in the urban environment of Hue. He is convinced that prior training would have reduced those casualties. Moving and fighting in a city contain inherent differences from fighting under other conditions. For example, the following special considerations, developed during the course of this research and supported by his experiences, lead him to conclude that more time should be spent on MOUT training.

1. 1:50,000 maps are ineffective in urban terrain.

2. Communication is difficult to non-existent.

3. Command and control is difficult to maintain.

4. Platoon leaders, squad leaders, and team leaders are directly responsible for the conduct of the battle.

5. Clearing buildings is a complex, difficult, and time-consuming task.

6. Dealing with civilians can be distracting and dangerous.

7. Dealing with rubble created by the battle is a new and difficult task.

8. Ammunition resupply is difficult.

9. Snipers can inflict tremendous casualties and delays.

10. Cover and concealment provided by buildings present new and dangerous situations every foot of the way.

Small unit leaders receive only eleven hours of MOUT instruction at the USAIS. This does not prepare them for the lethality of fighting in urban terrain. MOUT training needs to be expanded Army-wide and to be included in all phases of tactics. This includes offensive, defensive, retrograde, counterattack, and day and night operations.

A major problem with MOUT training is the absence of definitions of what soldiers should learn. At this time, there are no Soldier's Manual tasks for MOUT, and consequently, no Skill Qualification Test (SQT) tasks. Conditions and standards are not identified in Army doctrine. Moreover, units are not required to show proficiency on MOUT skills. All of this contributes to the low priority MOUT training receives in units.

SURVEY OF CURRENT MOUT TRAINING

This section presents an overview of current (1982) doctrine and training for MOUT. The purposes of the survey were to (1) identify skills or tasks recognized by U.S. Army doctrine for MOUT, and (2) determine which skills or tasks are included in current training.

Overview of Doctrine

Special Text 90-10 emphasizes that success of MOUT ultimately depends upon how well platoons and squads work as units (USAIS, 1979). In particular, successful combat operations in urban areas will depend heavily upon proper

employment of rifle squads. Moreover, squad success will be achieved only to the extent to which every member of the squad is skilled in fundamental (individual) techniques of urban combat (Department of Army, 1980). In recognition of the importance of individual and squad performance, the following overview of skills and tasks related to MOUT concentrates on fundamental skills and squad/platoon operations.

The outline in Table 1 presents fundamental skills and squad/platoon operations related to MOUT that are covered in doctrine. The degree of task specificity in the outline reflects the level of detail presented in doctrine. For example, Infantry Subcourse 0354-9 on MOUT provides the best instructional material for fundamental skills due to the large number of photographs illustrating correct, as well as incorrect, techniques. The MOUT Field Manual 90-10 is directed primarily toward operations at the battalion level and above, and therefore provides only cursory treatment of individual, squad, and platoon operations. Another source, MOUT Field Manual 90-10-1, deals with operations at the battalion level and below and is most appropriate for fundamental skills and squad/platoon operations. In general, the material in Field Manual 90-10-1 pertaining to fundamental skills overlaps with the Infantry Subcourse 0354-9, while the information on squad/platoon operations parallels Special Text 90-10, An Infantry Commander's Guide for Military Operations on Urbanized Terrain.

The fundamental skills presented in Table 1 are techniques to be mastered by each individual. These fundamental skills involve moving through city streets and within buildings, entering buildings, selecting and preparing firing positions, and camouflage techniques. A common principle among these skills is the need for maximum cover and concealment. For example, proper methods for climbing through windows, doors, or other building openings emphasize keeping a low silhouette. Selection of firing positions that take advantage of existing cover and concealment offered by buildings is given considerable attention. For example, it is necessary to fire a rifle from the left shoulder when firing from around the left corner of a building. The use of mines, obstacles, and demolitions is discussed in doctrine (Table 1). Although all soldiers should become familiar with mines, obstacles, and demolitions, these subjects should be the emphasis of specialized individuals.

The squad/platoon tasks are broadly divided into offensive, defensive, and reconnaissance operations (Table 1). These operations build upon the fundamental skills. For example, to successfully attack and clear buildings, a primary offensive task for squads, each member must know how to move through urban streets, enter buildings, clear rooms, as well as coordinate individual performance with other squad members. Doctrine provides a fairly thorough treatment of attacking and clearing, and preparing buildings for defense. However, rather cursory treatment is given to reorganization and reconnaissance. The success of a misson is linked to the amount of information available. For example, something as basic as street maps is critically important. However, doctrine only provides general guidelines for gathering such information (e.g., street maps may be obtained from local gas stations, Department of Army, 1980). The only form of reconnaissance mission explicitly covered in doctrine is a subterranean route reconnaissance. Obviously, more attention will need to be paid to information gathering techniques.

Table 1

Fundamental Skills and Squad/Platoon Tasks for MOUT

1. Fundamental (Individual) Urban Combat Skills
   - A. Movement (Field Manual 90-10-1, p. B1-B15; Infantry Subcourse 0354-9, Sec. I)
     1. Crossing a wall
     2. Looking and moving around a corner
     3. Moving past a ground-floor window
     4. Moving past a basement window
     5. Exiting a doorway
     6. Moving parallel to a building
     7. Crossing an open area
     8. Moving within building under attack (Field Manual 90-10-1, p. B1-B15; Infantry Subcourse 0354-9, Sec. VII, para. 36-37)
   - B. Entry Techniques
     1. Entry at upper levels (Field Manual 90-10-1, p. B-19-B31; Infantry Subcourse 0354-9, Sec. II)
        - a. Ascending
          - (1) Throwing a grappling hook
          - (2) Scaling a wall
          - (3) Entering a window
        - b. Descending
          - (1) Seat-hip rappel
     2. Entry at lower levels (same references as I. B. 1.)
        - a. Two-man unsupported lift
        - b. Two-man supported lift
        - c. Two-man lift with heels raised
        - d. One-man lift
        - e. Two-man pull
   - C. Use of hand grenades (Field Manual 90-10-1, p. B44-B52; Infantry Subcourse 0354-9, Sec. III)
     1. Throwing grenades through openings (windows, doorways, mouseholes) prior to entering buildings or rooms
     2. Throwing grenades up stairways to clear top of stairwells
   - D. Selection and use of firing positions (Field Manual 90-10-1, p. B52-B73; Infantry Subcourse 0354-9, Sec. IV)
     1. Select and occupy hasty (unprepared) positions
        - a. Firing around corners of buildings
        - b. From behind walls
        - c. From windows
        - d. From loopholes
        - e. From rooftops
     2. Techniques for preparing deliberate positions for
        - a. Firing from windows and loopholes
        - b. Sniper positions
        - c. Crew served weapons
          - (1) Recoilless weapons
          - (2) ATGM
          - (3) Machineguns

-continued-

Table 1
continued

E. Camouflage techniques (Field Manual 90-10-1, p. B79-B84; Special Text 90-10, p. A2-A8)
   1. Use of shadows
   2. Color and texture
   3. Dust
   4. Background
F. Detecting boobytraps (Field Manual 90-10-1, p. G17-G23; Infantry Subcourse 0354-9, Sec. V)
G. Mines
   1. Detecting mines (Field Manual 90-10-1, p. G17-G23; Infantry Subcourse 0354-9, Sec. V)
   2. Use of mines (Field Manual 90-10, p. D5; Field Manual 90-10-1, p. G9-G16; Special Text 90-10, p. E2-E5, E11-E13; Infantry Subcourse 0354-9, Sec. VIII)
      a. Record placement of mines
      b. M14 and M16 antipersonnel mines
      c. M15, M19, M21, M24 antitank mines
      d. Claymore mines
   3. Arming and disarming mines (Infantry Subcourse 0354-9, Sec. VIII)
      a. M14 and M16A1 anitpersonnel mine
      b. M15 antitank mine
      c. Molotov cocktail
H. Use of demolitions (Field Manual 90-10, Field Manual 90-10-1, App. H; Special Text 90-10, Annex H; Infantry Subcourse 0354-9, Sec. VII)
I. Use of obstacles (Field Manual 90-10, p. D1-D5; Field Manual 90-10-1, p. G1-G8; Special Text 90-10, p. E1-E2, E6-E10)
J. Firefighting (Field Manual 90-10-1, p. B74-B77)
   1. Defense against flame
   2. Offensive flame operations

II. Squad/Platoon Operations
A. Offensive
   1. Attack and clear buildings (Field Manual 90-10, Appendix G; Field Manual 90-10-1, p. 48-53, & Appendix F; Special Text 90-10, Ch. 3, & Annex D; Infantry Subcourse 0354-9, Sec. I, II, III, & VII)
      a. Attack buildings
         (1) Fire support to suppress defensive fire
         (2) Movement to advance assault force
         (3) Assault and enter building
      b. Clear buildings
         (1) Clearing techniques
         (2) Moving within buildings
      c. Reorganize
B. Defensive
   1. Fighting positions (Field Manual 90-10, App. C; Field Manual 90-10-1, App. E; Special Text 90-10, Annex C)
      a. Preparation of buildings
         (1) Selection of weapon positions
         (2) Preparation of weapon positions

-continued-

Table 1
continued

(a) Window positions
(b) Loopholes
(3) Securing and fortifying
(a) Doors
(b) Hallways
(c) Stairs
(d) Windows
(e) Floors
(f) Ceilings
(g) Unoccupied rooms
(h) Basements
(i) Upper floors
(j) Roofs
(4) Interior routes
(5) Fire prevention
(6) Communications
(7) Rubbling
(8) Obstacles
(9) Fields of fire
b. Tank/APC positions
c. ATGM positions
d. Sniper positions
2. Defense against armor (Field Manual 90-10-1, p. 66-72; Infantry Subcourse 0354-9, Sec. VIII, para. 81)
3. Nuclear, biological, and chemical (NBC) defense (Field Manual 90-10-1, App. D, Special Text 90-10, Annex B)
a. Protection
b. Mission oriented position posture
c. Detection teams
d. Decontamination
e. Other agents
(1) Smoke
(2) Riot control agents

C. Reconnaissance: Subterranean route reconnaissance

Status of Institutional Training

The survey of MOUT training at Fort Benning covered the range of infantry soldier development from basic training to instruction given to colonels preparing to take command of a battalion or brigade. Courses observed included OSUT, ANCOC, IOBC, IOAC, and IPCC.

One Station Unit Training. Fourteen hours of observation were made of MOUT training given to soldiers undergoing basic training. During this time training was observed, the instructors were interviewed, and training was assessed through administration of a multiple-choice test and a Perception of Training questionnaire.

The OSUT MOUT facility consists of eight wooden buildings. There are two single-story buildings and two two-story buildings on each side of a main street. The facility is assigned eight instructors with six typically present. Each company (108-130 soldiers) receives six hours of instruction in a one-day period. The training day is divided into a morning session, devoted to fundamental (individual) skills, and an afternoon session for squad operations. The training fulfilled the requirements in the program of instruction (USAIS & USAIC, 1981). An outline of the training is provided in Table 2.

Training begins with the principal instructor giving a 20-minute orientation. The students then rotate through five training stations: (1) throwing a grappling hook, (2) upper-level entry, (3) lower-level entry, (4) ground-level entry, and (5) firing positions (Table 2). The instructor at each station demonstrates the task and then each student performs the task. Depending upon the instructor, the student may be asked to repeat the task if not executed properly. Each instructor provides feedback to the student regarding his performance.

The most difficult task the students encountered was climbing a rope to enter a second-story window. For some students, mastering this technique was a matter of learning to climb a rope while encumbered with weapons and equipment. However, other students were not physically capable of rope climbing. If emphasis on this task continues, rope climbing exercises will need to be emphasized during physical training or other types of training.

The morning session was run efficiently, but there seemed to be room for improvement in the afternoon routine. Beginning at 1300 hours, students are given a 10-15 minute briefing on the squad operation of attacking and clearing buildings. This is followed by a 15-minute demonstration. The training company is then divided into squads and each squad performs the attack and clear operation (Table 2). This requires about 15 minutes per squad. The principal instructor briefly reviews the day's events (10-15 minutes) to conclude the training. Therefore, students are occupied for about one hour during the afternoon, leaving one hour of instruction time unaccounted for (six hours training required; presently receive four hours of training in morning and one hour in afternoon). Two stations are used to conduct the attack and clear, with two instructors at each station. This leaves two to four instructors available. Finally, during the attack and clear operations, half of the MOUT facility is not being used. Therefore, the current training

Table 2

MOUT Training in OSUT

I. Fundamental skills
   A. Enter upper-story window
      1. Throw grappling hook through upper-story window
      2. Enter upper-story window
         a. Rush building
         b. Scale rope to upper level (rope permanently secured and knotted every 12 inches)
         c. Throw grenade through window
         d. Enter window
         e. Fire M16A1 rifle, search and clear room
         f. Call "all clear"
   B. Enter lower-level window
      1. Three men rush building
         a. Two men set up as security
         b. One man throws grenade through window
      2. Two-man supported lift
      3. One-man lift
      4. Two-man lift
      5. Search and clear room
   C. Ground level entry
      1. Rush building
      2. Enter
      3. Search and clear room
   D. Firing positions
      1. Assume supported position outside building using LAW
      2. Assume hasty prone position from right and left corners of building using M16A1 rifle
      3. Assume prepared firing position at windows from inside building

II. Squad operation
   A. Attack and clear buildings
      1. Rush two-story buildings
      2. Enter through second-story window using ladder nailed to side of building
      3. Clear building
      4. Enter and clear one-story building behind the previously cleared two-story building

organization could tolerate additions during the afternoon. Such additions could include running four stations for the attack and clear operations that would double the time spent in training by individual soldiers, adding a station in which the squad plans and sets up in a defense of a building, or a station in which the trainees practice moving through the streets and between the buildings as a squad. This latter recommendation of incorporating more practice on movement techniques is especially relevant since little time is currently being spent on this important skill for MOUT. Alternatively, rather than adding more techniques, time could be spent repeating the attack and clear task.

A practical recommendation to improve teaching techniques of building clearing involves the use of a cut-away building. A structure of this nature would facilitate demonstrating and instructing clearing procedures. It would provide the opportunity to both critique and practice, using one structure.

A Perception of Training questionnaire was adapted from Whittenburg, Mietus, and Sterling (1980), and some of the questions for a multiple-choice test of knowledge about MOUT skills were drawn from an USAIS correspondence course (Infantry Subcourse 0354-9). Copies of the test and questionnaire are provided in Appendixes A and B, respectively. Questions were added or eliminated to reflect the material presented during OSUT training. The test and questionnaire should be considered pilot tools to aid in information gathering and not validated measurement devices.

The experimental design for analyzing the results of the multiple-choice test is provided in Table 3. The test was administered to some students in the morning prior to beginning MOUT training, then immediately following completion of MOUT training in the afternoon, the same test was administered to the entire company (n = 114). Therefore, 38 students received the test before and after MOUT training (pre- & posttest) and 76 students received only the posttest. Students were also classified by prior service experience: 31 students had prior active experience (defined by at least having previously gone through basic training in any branch of the service), 10 students had non-active experience (e.g., Reserve Officer Training Corps), and 73 students had no prior experience.

As illustrated in Figure 1, MOUT training improved test scores by about 35%. Mean number of correct answers, out of 14 questions, was significantly greater (F (1,150) = 88.36, $p < .001$) on the posttest (M = 11.7, SD = 1.7) compared to the pretest (M = 8.7, SD = 1.8).

Pre-exposure to the test did not affect posttest scores (Table 4). posttest scores of students who had taken the pretest (M = 12.1, SD = 1.7) were not statistically different (F (1,112) = 2.28) from posttest scores of students who received only the posttest (M = 11.6, SD = 1.7).

An analysis of variance was performed on test scores of students who had received both the pre- and posttest to determine whether prior service experience affected test scores. Service experience did not significantly affect test scores (F (2,35) = 0.18, $p > .05$). As shown in Table 4, students with prior active or non-active service experience tended to get slightly more

Table 3

Number of Students in OSUT MOUT Training
Classified by Test and Service Experience

		Prior Service Experience			
		Active	Non-Active	None	Total
Test	Pre & Post	8	4	26	38
	Post Only	23	6	47	76
	Total	31	10	73	114

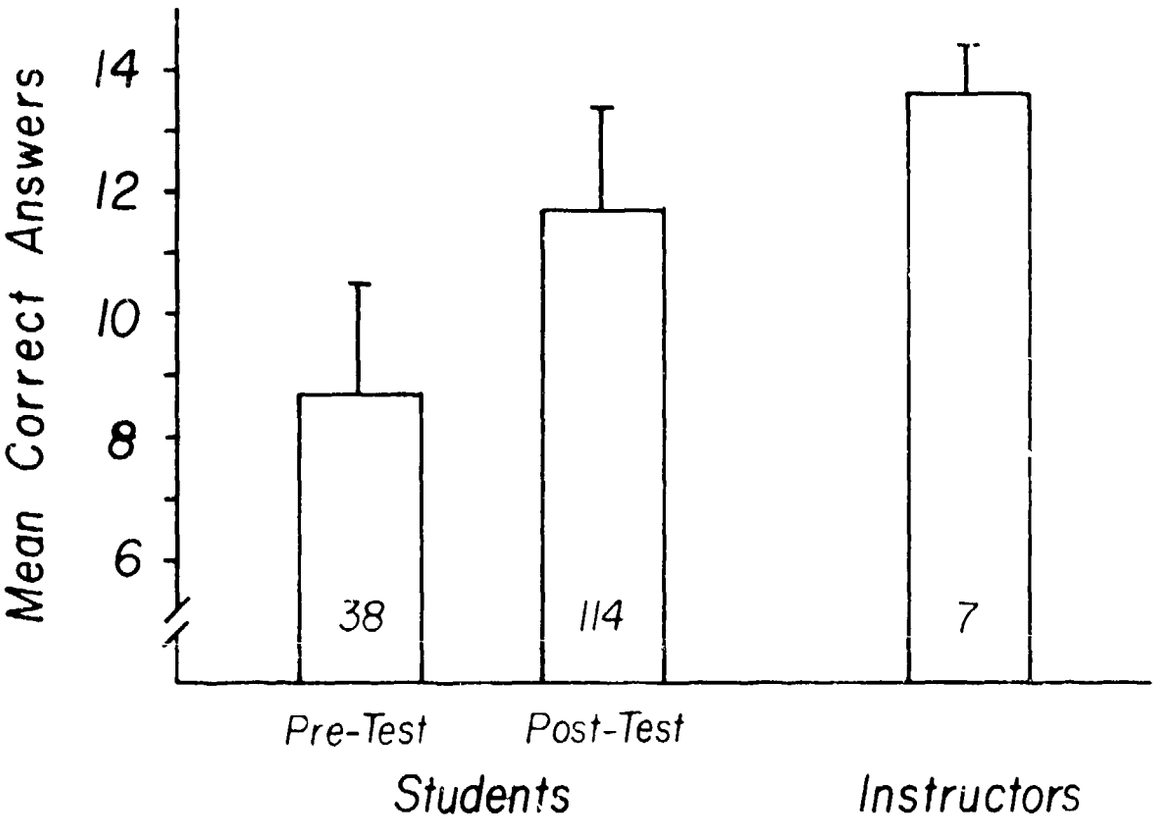

Figure 1. Mean number of correct answers (+ standard deviation) on the multiple-choice test given before (Pre) and after (Post) MOUT training. Numbers within the bars are number of OSUT students per group.

Table 4

Mean (standard deviation) Number of Correct Answers
on the Multiple-Choice Test Given
Before (Pre) and After (Post) OSUT MOUT Training

Prior Service Experience	Pre- & Posttest		Posttest Only
	Pre	Post	
Active	9.1 (2.5)	12.0 (2.7)	12.1 (1.6)
Non-Active	9.3 (1.0)	12.0 (1.0)	11.3 (1.5)
None	8.4 (1.7)	12.1 (1.6)	11.3 (1.7)

answers correct on the pretest than students with no prior experience, but posttest scores were very similar. There was no differential improvement in pre- to posttest scores relating to prior service experience (F (2,35) = 0.77, $p > .05$), rather, test scores increased significantly following training regardless of whether the students had prior service experience (F (1,35) = 111.85, $p < .001$). To substantiate the finding that prior service experience did not bias the test results, posttest scores were compared for students who had received only the posttest (Table 4). Again, prior service experience did not affect posttest scores (F (2,73) = 1.88, $p > .05$).

The instructors appeared to be capable trainers. They have been leading OSUT MOUT training for about seven months (range: 6-11 months) and four instructors had received MOUT training in West Germany. The multiple-choice test also was administered to the instructors and they did very well (Figure 1). Five of the seven instructors answered all 14 questions correctly, and the other two instructors reveived scores of 13 and 12 correct answers.

Responses from students and instructors to the Perception of Training questionnaire indicate a high regard for the quality of MOUT training and the importance of such training to the soldier's curriculum. Copies of the questionnaire administered to the students and instructors, and a summary of their responses, are provided in Appendix B. One form of the questionnaire was administered to the students and a parallel form was given to the instructors. Seven instructors and 116 students completed the questionnaire. Each question could be answered on a rating scale of one to five. Questions fell into five categories: (1) instruction, (2) benefits from training, (3) time management, (4) realism, and (5) interest.

A majority of the students felt that the MOUT instruction was "very well" prepared (52%) and "very often" understandable (56%). The instructors concurred with the students' opinions. However, the students and instructors disagreed about the frequency of feedback. Students believed they received feedback about their performance less frequently than the instructors felt feedback was given (see question #3). This discrepancy could be attributed to several factors. Since the instructor to student ratio is low, the instructors could be giving quite a lot of feedback and still not have the opportunity to critique every student. Also, the students may be expressing a desire for more approval feedback when performance was acceptable. The feeling that the feedback could have been more helpful was noted by both the students and instructors (see question #4).

The students and instructors felt that the students benefited from MOUT training. The students and instructors responded that MOUT training would help the students to fight "much" (46%) and "very much" (67%) better, respectively. A majority of the students said they learned "much" (54%) from the training and could perform "most" (44%) to "all" (47%) of the skills. The instructors were a bit more conservative, responding that the students could correctly perform "most" (67%) of the skills. The students were more confident than the instructors about performance at the squad level. The students felt the squads worked "well" (40%) to "very well" (36%) together during the attack and clear operation. The instructors, however, felt the squads only worked

"moderately" well together (67%). The instructors' opinion is probably the more accurate one. Moreover, when the students were asked, "Which tasks need more practice?", a frequent response was "attacking and clearing buildings." Therefore, both the students and the instructors recognize the need for good squad performance.

There was not a consensus on whether the students were given enough time to practice each task (see question #10). This probably reflects the fact that some tasks, like entering an upper story window and attacking and clearing buildings, were listed as needing more practice time whereas other tasks may have been adequately covered.

Generally, the training was not considered very realistic (see question #12). However, it needs to be kept in mind that the primary purpose of OSUT MOUT training is to teach urban combat skills and not to simulate battle conditions.

A primary finding of this questionnaire was the considerable interest the students had for MOUT training. The majority (73%) of the students wanted more MOUT training "to a large" or "to a very large" extent (see question #13). When asked for suggestions to improve training, students and instructors requested: (1) more realistic buildings, (2) use of Multiple Integrated Laser Engagement System (MILES) equipment, (3) aggressors, (4) more instructors, (5) teaching of sniper positions, (6) eliminating use of gas masks, (7) more emphasis on movement techniques, and (8) integrating MOUT into other training. It should be noted, however, that prior to expanding any program to include additional techniques, efforts should be made to ensure the students can master all of the skills in the existing program. Unfortunately, there are presently no provisions for evaluating the students' performance in OSUT MOUT training. The instructors are doing an acceptable job of teaching the material, but the students are not required to learn the techniques. Practical tests, although time consuming, are effective motivators for learning as well as good tools for instructor and program evaluation.

Infantry Officer's Basic Course and Advanced Noncommissioned Officer's Course. The summary descriptions of IOBC and ANCOC are presented jointly since the MOUT course material is identical. The goal of these classes is to teach the tactics and techniques required to train a platoon in MOUT. During the eleven hours of instruction, three hours are devoted to classroom lecture and eight hours to practical instruction. The practical exercises are conducted at the Harmony Church MOUT facility. Again, these are wooden buildings as in the OSUT facility, but the Harmony Church facility has about 25 buildings covering about six blocks. During the morning, platoons rotate through five training stations. The afternoon is devoted to a training exercise in which half the class defends and the other half attacks the MOUT training facility. The five training stations include entry techniques (grappling hooks, lifts, and pulls), clearing a single-story building, planning an attack of a built-up area, preparing a building for defense, and planning a defense of a built-up area. Students remain at each station for about 45 minutes.

At the entry techniques station, students receive about 20 minutes of lecture and demonstration, and are then "invited" to practice each technique for the next 25 minutes. However, the practice session is loosely organized, and roughly a third of the students elect to merely observe and not practice the techniques. There is sufficient time and facilities for students to try each skill. There are two windows for throwing a grappling hook and scaling the wall, and two windows for lifts and pulls.

The building-clearing station is a one-story building with a mousehole for entry. Students receive about 15 minutes of instruction and demonstration, and then practice, a squad at a time, clearing the building. After each squad finishes, the instructor critiques the performance.

The format of the defense of a stronghold station is all lecture and demonstration. A two-story building previously had been prepared as a defensive stronghold, and the instructor takes the students on a tour of the entire building and outside area, describing each point of preparation.

At each of the planning stations, the instructor gives a 15-minute lecture on offense or defense, and gives the students a training scenario to plan. The students are then given 15 minutes to recon the area and plan their offense or defense as a platoon leader. The last 15 minutes are involved with student presentations and instructor critiques. The attack/defend training exercise lasts about 20 minutes and is followed by each platoon receiving a critique from an instructor.

A shortcoming of the day's instruction is that the students are not required to learn the skills. The instructors do an adequate job of presenting the material and providing performance feedback. However, the students are not tested on ability to perform. Moreover, all of the IOBC and some of the ANCOC students outrank the instructors; therefore, the instructors cannot use the added inducement of superior rank to motivate the students to practice and learn the skills. However, students attending IOBC and ANCOC are tested on MOUT doctrine and skills. The students must correctly answer seven of ten knowledge questions on MOUT to pass the section on MOUT.

Infantry Officer's Advanced Course. The goal of IOAC MOUT training is to prepare students to successfully plan, support, and conduct MOUT as company grade officers. The course is organized into 13 hours for offense and 14 hours for defense. Course material for the offensive and defensive sections is provided to the student in the form of "advance sheets." One class is spent discussing the fundamentals and techniques of MOUT at the platoon and squad levels. Two classes are devoted to studying the U.S. and Soviet offensive and defensive doctrine for MOUT. The next class is a reconnaissance of the downtown area of Columbus, Georgia. This sets the stage for the next class, which is a tactical planning exercise with students working in groups as battalion staffs. During the last class, students working in groups solve tactical problems at company/team level.

The IOAC students are given objective knowledge tests to determine successful completion of the course. There are six questions on MOUT offense and these are incorporated within a 12-question section on special operations.

To pass this section, the student must correctly answer nine of the twelve questions. It would be possible to pass this section with correctly answering only three of the six questions on MOUT. There are four to five questions on MOUT defense (there are three versions of the test) in a section shared with seven questions on defense of an obstacle. Students must correctly answer seven of the ten questions. Therefore, it would be possible to pass this section with correctly answering only one or two of the four or five questions on MOUT.

In a survey of IOAC graduates, administered by the Directorate of Evaluation, USAIS, 59% of the 38 respondents performed MOUT training in their present assignment. Of the respondents that had performed MOUT training, 35% felt that IOAC had prepared them "very well" for MOUT; 57% felt IOAC had prepared them "fairly well"; and 8% felt "unprepared." A recurring comment about IOAC obtained from the graduate survey, as well as from the end-of-course evaluation questionnaire, concerned a call for more attention to details and specifics of MOUT, and less instruction dealing with generalities. For example, one student commented, "We learned where to defend, but not how." Another IOAC graduate who was currently assigned as a "doctrine writer for MOUT" said, "I've found that the defensive doctrine is weak and confusing."

Infantry Pre-Command Course. During the IPCC, three hours of classroom instruction are devoted to MOUT topics. This class was observed on January 8, 1982. The purpose of this block of instruction was to present an overview of the characteristics of urban warfare, as well as U.S. and enemy offensive and defensive considerations. The material presented paralleled Field Manual 90-10 and, therefore, emphasized doctrine and tactics for MOUT at the battalion level and above (Department of Army, 1979).

In an end-of-course questionnaire administered by the Directorate of Evaluation, USAIS, students were asked to rate the value of the MOUT block of instruction. Ratings for courses during 1981 indicated that the material was considered valuable. However, students requested more guidelines be presented on ways to set up MOUT training programs. A survey administered in February 1982, to graduates of the IPCC revealed that 56% of the 53 respondents felt that MOUT instruction in IPCC had above-average relevance.

MOUT Training in Units

More emphasis needs to be placed on MOUT training within units. Interviews with students attending courses at the USAIS indicated little time was devoted to MOUT during unit training. Out of nine NCOs attending ANCOC that were interviewed, not one had had MOUT training as an annual event. Many of the ANCOC students probably had not received MOUT training since basic training.

Officers attending IOAC probably have received very little MOUT training since completing IOBC. Some of the officers interviewed said they had conducted MOUT training in their units, but no specifics about the frequency of training were given. Most of the officers said they had not planned or taken part in a detailed attack or defense of urban terrain during command post or field exercises. Clearly, not only does the use of existing MOUT facilities need to

be emphasized, but more importantly, unit training that can be conducted outside of a MOUT facility must be given priority. The experience of the senior author supports the conclusion that insufficient MOUT training is being conducted in infantry units.

The crux of the matter is that infantry leaders are prepared inadequately to conduct MOUT training. The platoon leaders and sergeants receive about two hours of individual skills training. The company, battalion, and brigade commanders receive no instruction on how to implement a MOUT training program. MOUT skills should be incorporated into all phases of training. This is as simple as teaching soldiers to climb a rope for upper-level entry techniques. With a little imagination, almost all MOUT skills can be incorporated into other training. This could include such subjects as marksmanship, use of hand grenades, movement techniques, use of cover and concealment, reconnaissance, and physical training. Finally, trainers need to identify links between MOUT training and other types of training, and to emphasize these to the soldiers.

Fort Campbell. Fort Campbell has two facilities for MOUT training, Range 44 Close Combat Course and Craig Village. Training on Range 44 emphasizes individual and squad-level combat skills through drills promoting quick reactions and teamwork. Some of the skills include:

1. hand-to-hand combat,
2. quick fire,
3. crossing obstacles,
4. attacking and clearing buildings,
5. entering a building from ground level and while rappelling,
6. detecting booby traps,
7. clearing streets,
8. detecting the enemy, and
9. movement techniques.

Six of the nine stations consist of portions of buildings of various configurations (single-story, two-story, tower), each offering training problems for individuals, teams, and squads. The buildings are equipped with Infantry Remoted Target System (IRETS) targets, which may be controlled by the unit leader. Small arms live fire ammunition may be used at these stations. There is also a hand-to-hand combat area, a quick fire range, and a building constructed of automobile tires. The tire building allows use of live ammunition (small arms, grenades) while clearing the building. Range 44 is designed support a three-day or four-day training exercise for a company size element. The order in which the unit proceeds through the various stations and the training goals for each situation are left to the discretion of the unit commander. This situation leads to a lack of standardization between units within the same battalion.

It is recommended that units complete training at Range 44 prior to using the other MOUT facility, Craig Village. The 26 wooden, one-story and two-story buildings of Craig Village are designed and positioned to resemble a small European village.

Two companies were observed using Craig Village. The first company practiced MOUT techniques for about two hours while preparing for the MOUT phase of an upcoming platoon Army Training and Evaluation Program (ARTEP). There were two platoons; one reviewed attacking and clearing techniques while the other prepared two buildings for defense. The platoon practicing offensive skills concentrated on ground-level entry techniques (there was no equipment for upper-level entry) and room clearing procedures. The platoons then took turns attacking and defending two buildings. The company commander gave an evaluation of each platoon's performance. This company had received about four hours of classroom MOUT instruction and about six hours of skills demonstration and practice within the unit. This instruction was prepared and presented by the company's NCOs.

This was the company's first training opportunity in Craig Village. Previously, the company had undergone MOUT training at Fort Chaffee about seven months ago. However, there had been considerable troop turnover since the Fort Chaffee training. The company commander estimated 100% turnover every nine months. This high turnover rate undermines training squads or platoons as effective combat units.

Another company was observed performing the MOUT phase of a platoon ARTEP, Attack of an Urban Area (ARTEP 7-15). There were only ten defenders assigned to the village, and the attacking company was instructed to clear only the perimeter buildings. Furthermore, none of the buildings were prepared for defense (the windows were not boarded and firing positions were not fortified with sandbags). Due to the small number of defenders and buildings, the mission of securing the village was accomplished in only 15 minutes.

The company's execution of the mission reflected the need for MOUT training to be incorporated within every training cycle. The performance of the various functional units could have been better organized. For example, squad members occasionally became bunched up in the building they were clearing and often did not maintain optimal cover and concealment when clearing buildings or moving through the streets. Only about 50% of the company was present in the field for this ARTEP. The turnover and attendance figures indicate that MOUT training would need to be conducted on a quarterly basis to insure that everyone in the company receives MOUT training. The question was raised whether training facility availability is a problem. The company commander indicated that reserving a training site such as Craig Village was not a problem and that MILES equipment also could be easily procured, especially during the "gold" phase or prime training period of a training cycle. However, the company was committed to other missions during the next several "gold phases" so that optimal MOUT training (perhaps a week in Craig Village) would have to be put off for several (number unspecified) training cycles. It appears that, at present, a primary obstacle to MOUT training is not the availability of facilities; rather, the problem is the lack of emphasis on MOUT training. When units are required to conduct MOUT training, or units are required to show proficiency on MOUT, then such training will become routine.

Following completion of the ARTEP, 37 members of this company completed the Perception of Training questionnaire. Respondents included two officers, six NCOs, and 29 enlisted personnel. A copy of the questionnaire with the distribution of responses to each question is provided in Appendix C. This was the same questionnaire that was administered to OSUT students.

In general, responses to the questionnaire were more moderate than those of the OSUT students (see Appendix B). However, like the OSUT students, Fort Campbell company members felt that they benefited from training and that MOUT training should be expanded. There was no majority opinion on questions concerning the quality of instruction received before or during MOUT training. Yet, median responses indicated that unit members felt they were moderately (46%) prepared for MOUT training, "often" (46%) understood the mission, and "often" (32%) received performance feedback.

Unit members felt they benefited from MOUT training. Specifically, they thought that MOUT training would help them to fight "much" (38%) to "very much" (38%) better. They were less positive about how much they learned during MOUT training. This may reflect the fact that little training time was spent on MOUT skills prior to the ARTEP. The fact that 85% said they learned "none", "few", or "some" new skills, as opposed to 16% who said they learned "many" or "very many" new skills and the opinion of 43% who thought the squads only worked "moderately" well together, indicates that MOUT training needs to be improved in terms of expanding the number of skills presented and the amount of training time. Unit members did feel they needed more practice time: 79% responded that only "to some extent" were they given enough time to practice each task. There was considerable interest in expanding MOUT training: 91% wanted more MOUT training "to some extent", "to a large extent", or "to a very large extent". Suggestions to improve training included: (1) using MILES, (2) equipment for upper-level entry, (3) "civilians" in the training village, and (4) clearing modern facilities. The opinion that the squads worked only moderately well together was supported by comments to the question, "Which tasks, if any, need more practice?" The most frequent response was, "attacking and clearing buildings."

MOUT Training in Europe. Observations and interviews were conducted in Berlin and Hammelburg, in West Germany, and in several locations in England, during October of 1982.

The itinerary for the European observations included:

1. West Berlin (one week; see Appendix D for detailed narrative)

    a. U.S. facility (Doughboy City I), being used by a U.S. company

    b. British MOUT facility (Ruhleben)

    c. Interview with French Infantry Regimental Commander

2. Hammelburg (West German Infantry School; two weeks; see Appendix E for detailed narrative and Appendix F for instructional material)

   a. Bonnland

      (1) Observed U.S. battalion training (one week)

      (2) Observed West German battalion elements training (one week)

   b. MOUT Confidence Course

   c. Marksmanship/Sniper Training

3. Great Britain (one week; see Appendix G for detailed narrative)

   a. Ministry of Defence (London)

   b. Cinque Ports Training Area

   c. Longmoor Training Area

   d. Defence Operational Analysis Establishment

   e. British Infantry School (Warminster)

The purpose of this trip was to acquire a more global perspective of MOUT, through a comparison of training doctrine and procedures in Europe with that in the U.S. In addition to observing U.S. MOUT training in Europe, West German and British training programs and facilities were studied. While the time spent was brief, the units observed were reported to be representative, allowing several generalizations concerning MOUT training in Europe to be made:

1. Both the West German and British forces seem to place more emphasis on MOUT than does the U.S. Army.

2. The MOUT facilities of both the West German and British Armies are more realistic, less costly to maintain, and show more imaginative use than does the premier U.S. facility in Europe.

3. Both the West German and British forces practiced communications, logistics, and casualty evacuation during training. The U.S. Army units observed practiced none of these.

Both the British and West Germans placed more emphasis on MOUT than did U.S. forces, as evidenced by the amount of MOUT training required. Every infantry battalion in the West German Army spends two weeks out of every 18-month training cycle in intensive MOUT training. The British Army uses a similar schedule. Many infantry battalions in USAREUR have never received MOUT training.

The quality of U.S. and West German training was examined when both a U.S. Army unit and a West German unit were observed while training at the same site. The nine individual skills being taught were completed by U.S. soldiers within one day of training, while the West German unit spent five to seven days practicing individual skills. The West German platoon leader, who conducted all training for his unit, made each man perform each skill flawlessly before allowing him to advance to another skill. Soldiers repeated training until they got it right. West German Army units typically reach battalion-level training on the twelfth day of their two-week training period. In contrast, the U.S. unit began battalion-level training on the fourth day of the same training schedule.

Additionally, U.S. soldiers were observed assaulting buildings in the Bonnland facility (Hammelburg) in company-level and battalion-level exercises with limited knowledge and practice of individual skills (see Figure 2). Attacks usually took 30-40 minutes and ended with a critique, the main theme of which was "we need to do better, but we don't have time to do it again; let's move on to the next exercise." The U.S. units acknowledged their shortcomings and went on to something else. Conversely, the West German unit observed practiced the exercises until they were done correctly.

The following comments about facilities are based on observation. Doughboy City in West Berlin is a sterile and unrealistic training area, as there are no trees, shrubs, grass or common street paraphernalia. The buildings are obviously intended for training. They contain no trace of simulated realism, having only bare concrete walls and floors. Little effort has been made to incorporate into the buildings any targets, furniture, or [illegible] imaginative and realistic training augmentations. On the other hand, the British facility in West Berlin (Ruhleben) was under extensive renovation and retained trees, shrubs and grass as part of the design (see Figure 3). It appeared more like an actual town than did the U.S. training area. The British went to great length to enhance realism. One of their design ideas was the construction of a facade 40 feet high and 250 feet long, simulating a continuation of the city and blocking the view of an assembly area. It is important to note that new U.S. construction, as well as that being done at Ruhleben, has applied other lessons learned from the initial U.S. effort in Berlin. Finally, the West German facility at Hammelburg and the British facilities in England also contained imaginative and realistic training features that could benefit U.S. MOUT facility planning in the future.

Both West German and British Armies practice communications, logistics, and casualty care/evacuation during MOUT training, while the U.S. forces observed practiced none of these. Both allies used radio communication with wire back-up. The wire was actually laid during exercises. U.S. personnel stated that wire would probably be the best form of communication, but their units then proceeded to use radios. In a West German platoon observed, a man was designated to issue and redistribute ammunition after each building was secured. This was actually practiced during exercises. Casualties also were treated realistically by both of our allies. Although it was time-consuming, they employed all immediate treatment and evacuation procedures.

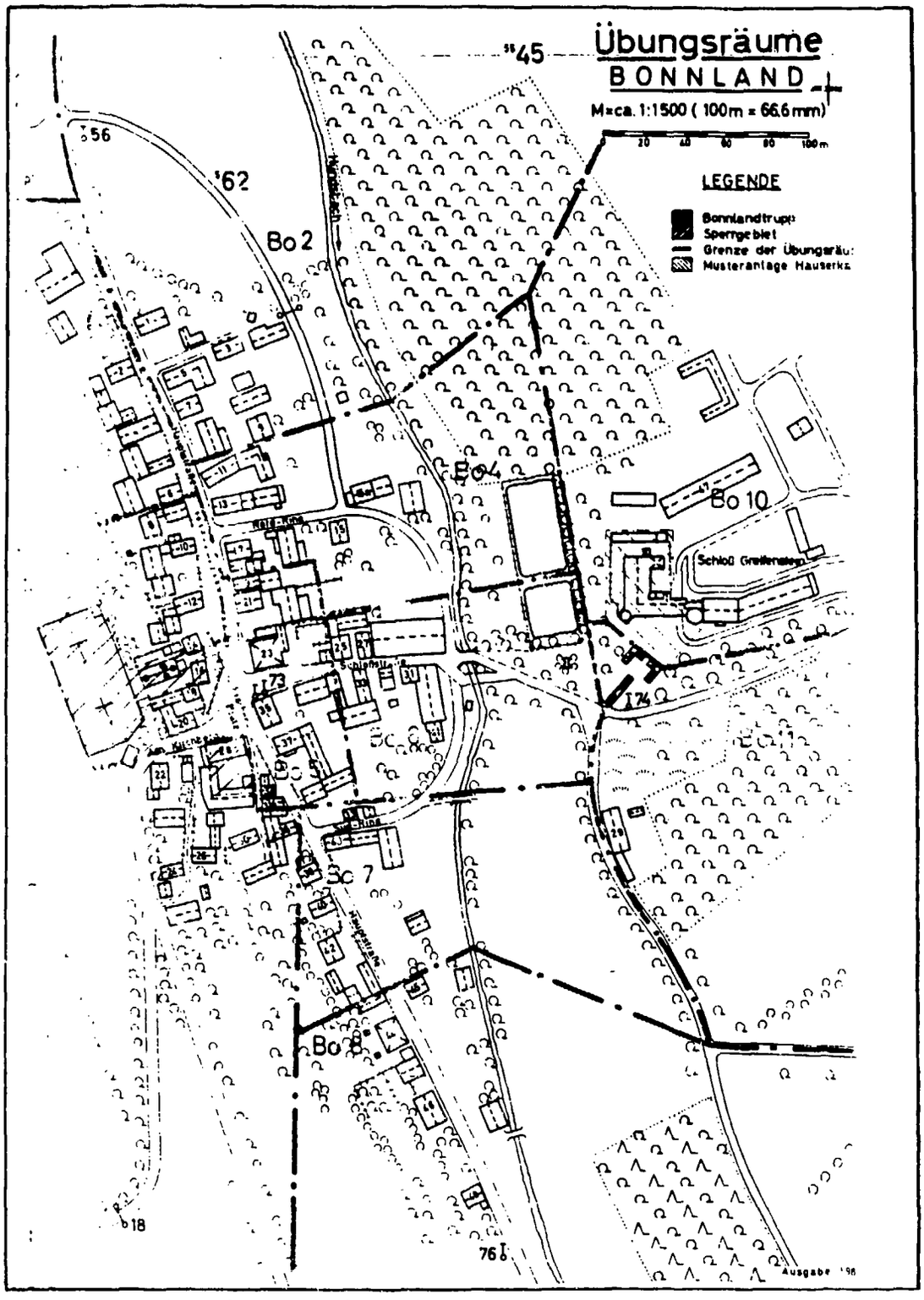

Figure 2. Bonnland Training Site
Hammelburg, Federal Republic of Germany

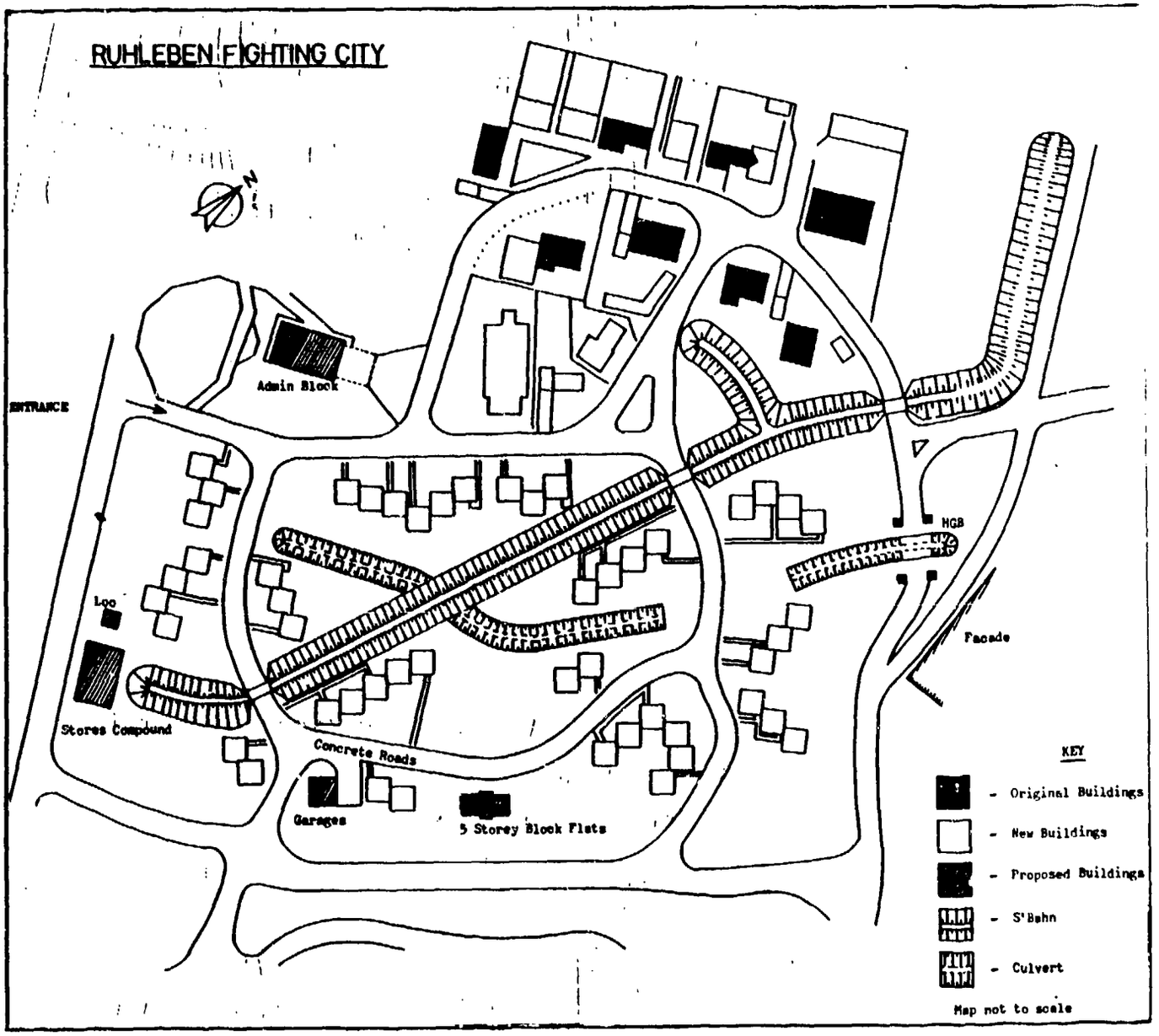

Figure 3. Ruhleben Training Facility for MOUT
British Sector, Berlin

Snipers in MOUT

Several characteristics of urban environments affect the ability of soldiers to use timely and accurately placed fire on opposing force personnel and vehicles. Although they have not been systematically classified, examined, and verified, the following characteristics have been mentioned throughout the MOUT literature:

1. short engagement ranges,

2. reduced target exposure time,

3. widely varying fields of fire.

4. dead space in three dimensions,

5. projected difficulty of ammunition resupply, and

6. possible requirement for increased exposure while firing.

The role of "snipers" in urban fighting is greatly magnified due to the large number of possible firing positions provided by the buildings and to the ability of snipers to conduct concealed withdrawal to alternate positions. During the Vietnam conflict, the extensive use of snipers against U.S. forces showed the value of one or two men sniping from alternate positions. One sniper could halt the advance of a rifle company. When snipers were used in Hue during the 1968 Tet offensive, they limited a unit's advance to less than 500 meters per day. Snipers forced the attacking units to deploy early, and allowed the enemy time to react to the main assault. At other times, snipers acting alone slowed the forward advance. Snipers often appeared behind the advance in buildings that had been previously cleared. This action forced the attacking unit to turn around and reclear a building. It is estimated that over 50% of the casualties from one company fighting in Hue were caused by snipers. It appeared that the enemy did not normally employ individual snipers, but employed them in a group of two or three men who covered each other with fire as they continually withdrew to alternate prepared positions. Their weapons included rifles, machine guns, and rocket-propelled grenades. The casualties caused by the incessant sniper fire resulted in decreased esprit and aggressiveness from the attackers, and forced the units to fight at squad and lower levels (personal experience).

Present MOUT instruction gives insufficient emphasis to the magnified role of the sniper in MOUT. In the IOBC and ANCOC classes, snipers are mentioned, but their use is not stressed. Even without the emphasis, each class employs snipers during practical exercises, but usually only in the first and last lines of defense. In the first line, snipers man the observation posts, and in the last line, they are placed around strongholds on upper floors. With the MILES system, three or four well-placed snipers could decimate the attacking force.

In summary, snipers in the defense can:

1. force units to deploy early,
2. slow down attacks,
3. inflict great casualties,
4. act negatively on morale and aggressiveness,
5. force decentralized control to squad level and below, breaking up the cohesiveness of the attack, and
6. give the main defensive line time to react to the primary area of the assault.

Due to their role in MOUT, snipers can and should be incorporated throughout the defense.

Command and Control

Field Manual 90-10 states that MOUT battles will be characterized by "centralized planning and decentralized execution" (Department of Army, 1979). This means that the execution of an attack or defense will be carried out at a lower level than the planning phase. While this is basically the same for all combat operations, it is especially applicable to MOUT. Due to the characteristics of MOUT terrain, action by squads, teams, and individuals will be the rule. Very seldom will a formation larger than a squad be able to fire and maneuver. Because of the decentralized execution required in MOUT, detailed planning must be accomplished prior to the action. For the attacking force, maps of a considerably larger scale than standard military maps are a prerequisite for mission accomplishment. Being able to identify building construction and probable interior design is a skill needed by all personnel, especially all leaders.

Ellefsen et al. (1981) have developed an outstanding training program to assist troops in learning the nature of the urban environment. The report includes the identification of building types and characteristics. Some of this information is taught to IOAC students during their 27-hour block of MOUT instruction. However, none of the other courses, including the IPCC, include this instruction. Due to the detailed planning required for MOUT, the ability to perform an urban terrain analysis is vital to all leaders. The ability to look at a building and (1) identify the construction material, (2) deduce the probable interior design, (3) forecast what type of weapon could breach the building, and (4) identify probable strong points or weak points, would dramatically improve the probability of mission accomplishment. MOUT requirements related to urban building characteristics are presented in Table 5 (Ellefsen et al., 1981).

Table 5

Urban Building Characteristics Related To MOUT Training Requirements

MOUT Requirements	Urban Building Characteristics														
	Proportion of walls to windows	Wall composition	Interior wall and partitions composition and thickness	Stair and elevator modules	Venting patterns	Floor plan horizontal and vertical	Roof composition	Floor and ceiling composition	Local terrain	Room dimensions	Function related interior furnishing	Fields of fire	Aiming distances	Line of sight	Circulation patterns
Troop Protection Cover	X	X	X	X											
Concealment	X			X	X	X									
Escape				X		X									
Tactical Sniper Positions		X				X	X								
MG Positions		X							X						
Anti-Tank Weapon		X								X	X	X	X	X	
Anti-Aircraft Weapon						X	X								
Tactical Building Entry		X				X		X							X
Building Clearing			X			X									X

The more useful or meaningful the information a soldier has about the battle environment, the better his chances for mission accomplishment. The ability to understand and analyze urban terrain is too important a subject to be taught only to potential company commanders and staff officers (IOAC and IPCC). All of the other leader courses (IOBC and ANCOC) also should include urban terrain analysis.

Mapping as a Training/Operating Tool for MOUT

Most experts link the importance of terrain familiarization with military success. This link is even more critical in MOUT. For example, the U.S. Army Science Board Ad Hoc Group (1978) asserts that "planning and preparation for MOBA would appear to be more important to an effective city defense than new and original concepts" (p. 22). Also, Hayes (1980) acknowledges the need for a mapping system that permits simulated travel through a mapped area. In this respect, he identifies a videodisc on tactical mapping systems developed by the Advanced Research Project Agency which is capable of displaying important details of the urban environment.

In examining the usefulness of maps during MOUT, it is necessary to pose the following question: What physical characteristics of the urban environment do soldiers need to know to operate in MOUT? They require knowledge concerning buildings, blocks (i.e., rows of buildings), streets (e.g., width, composition), street configuration, and the location of important structures. The U.S. Army Science Board Ad Hoc Group (1978) suggests that detailed urban maps also should denote transportation routes, communication systems, underground installations, and key government centers.

The planning phase of a MOUT battle includes gathering as much information as possible about the probable battle area. This may include detailed reconnaissance, both aerial and ground; information from residents or POW's concerning the location of sewers or subways, street widths, and building heights; city maps from gas stations or city governments; and the location of open spaces, hospitals, airports, churches, military installations, radio stations, water purification plants, industrial areas, etc. All of this information is needed; in fact, it is critical for the planning of MOUT operations. The results of a unit attacking without this information would be the same as staging an attack over difficult terrain without any maps.

It is also necessary to focus on those individuals using cartographic information. The anticipated users of MOUT information would range from the individual soldier to division level or higher commanders. Normally, map usage at unit levels would be relevant to the commanders, staff officers, and all leaders of infantry, armor, artillery, aviation, engineering, signal, and transportation units. A MOUT map usage program would facilitate navigation and urban terrain analysis, and would lead to the creation of sound tactical plans. In the latter regard, these plans would include the assignment of forces, movement to or from various positions using maximum cover and concealment, weapons employment, and offensive/defensive strategies.

Although the operational aspects of MOUT stress the identification of urban information, the training should focus on how to obtain and disseminate this information. Existing training should be examined for its appropriateness to convey key MOUT information. As Hayes (1980) asserts, it is desirable for an urban terrain representation to allow the user to "see realistic, detailed, ground-level perspective images and 'travel' through the area prior to actually being there" (p. A-106).

In considering the utility of mapping for MOUT, several research questions must be answered. As previously discussed, it is important to determine the information requirements regarding MOUT that would be incorporated in any urban terrain representation. Systematic examination of the urban environment is needed to insure the inclusion of critical elements. Also, this research phase must recognize the relationship between the user of MOUT information and the nature of the information that is required. For example, a soldier may be concerned primarily with the cover and concealment provided by urban buildings, the placement of weapons, and fields of fire for those weapons. In contrast, an Army commander may benefit more from knowing avenues of approach, sectors for defense, and the amount of flexibility offered by the urban terrain. Similarly, the extent to which MOUT information requirements differ across functional units must be considered, as well as whether individual differences exist in the ability to acquire MOUT information. For example, research efforts may be directed toward examining the role of cognitive mapping. Also, the effect of the soldier's background warrants attention. Jureidini et al. (1979) maintain that soldiers with an urban background are better suited to MOUT, and recommend that such soldiers comprise MOUT units. Clearly, the information required by various Army units must be ascertained in order to generate appropriate urban terrain representations.

Once the required information is defined, systematic research is needed to determine the best medium for its presentation to Army personnel engaged in urban warfare. In this respect, the requisite MOUT information should be matched with the capability of each proposed medium to portray these critical features. Also, it is necessary to demonstrate that alternative media provide the complexity and realism of urban environments. Possible media include videodisc, digitized terrain representation, and a continuation of the use of larger scale topographical maps (e.g., 1:5000). During observations made in West Berlin, it was discovered that the British Army has recognized the problem of map scale and is experimenting with a 1:4000 scale, black-and-white map for MOUT planning and execution (see Figure 4).

Weapon Systems

The analysis of weapon systems in urban combat focuses on the following areas: the nature of available weapons, their appropriateness/deficiencies in MOUT, and implications of the weapon-MOUT relationship for Army training. As Schecter (1977) argues, materiel managers must "challenge new developments with the question, 'How will it work in town?'" (p. 62). This section seeks answers to his question.

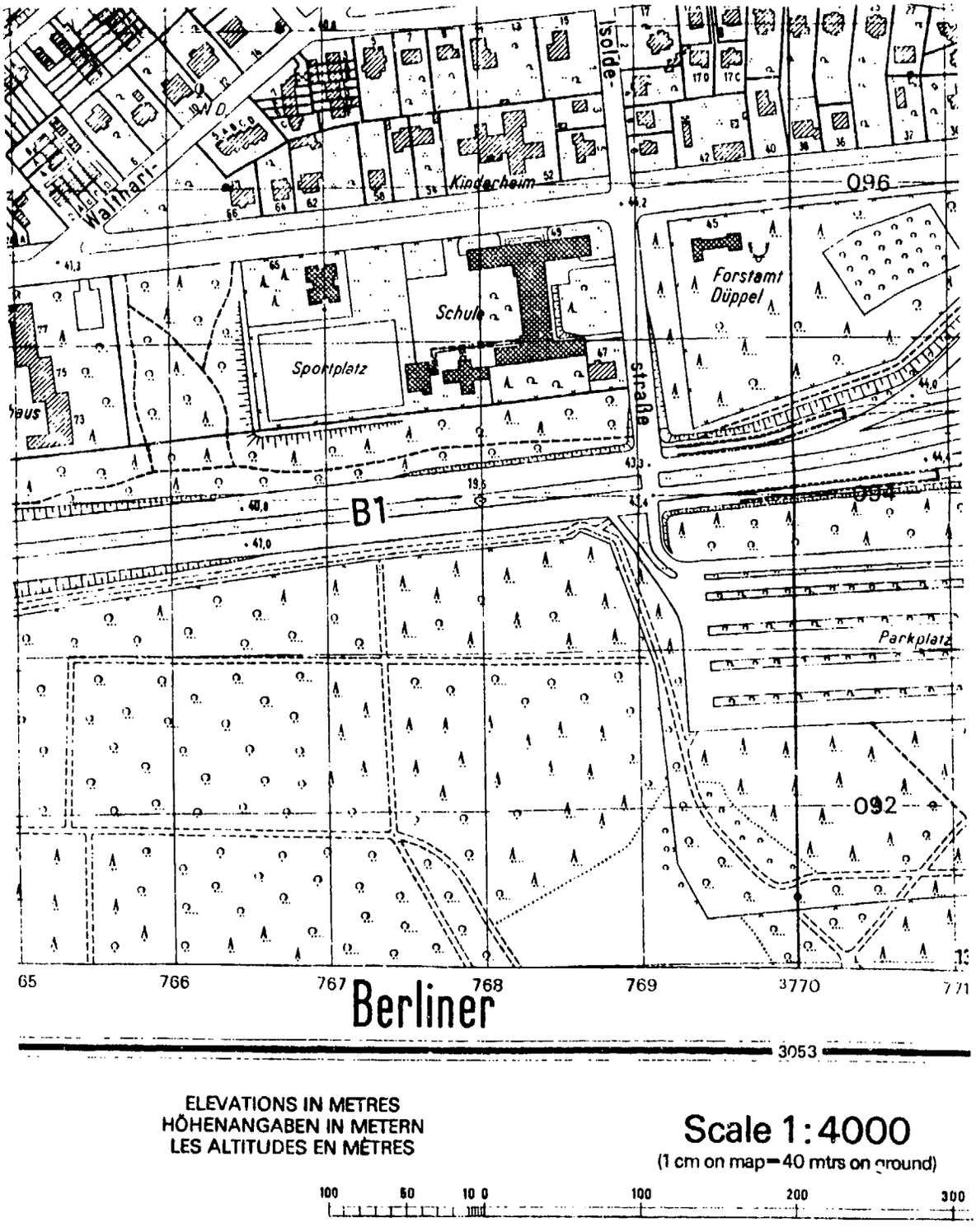

Figure 4. 1:4000 scale map used in Berlin.

The U.S. Army Science Board Ad Hoc Group (1978) identifies several available weapon systems, including small caliber weapons, artillery and mortars, large caliber manpack weapons, and fuel-air explosive (FAE) weapons. Small caliber weapons, up to 40mm, include either individually carried small arms or support weapons, including machineguns and vehicle mounted guns. Artillery and mortars include howitzers and recoilless rifles. Anti-tank weapons such as the tube-launched, optically tracked, wire-command linked guided missile system (TOW), Dragon, and the Light Anti-tank Weapon (LAW) provide heavy fire power. Precision guided missiles are used for the destruction of small, hard targets, such as armor and bunkers. They could be used as wall breachers to penetrate structures and bunkers. As the U.S. Army Science Board Ad Hoc Group (1978) observes, "Fragmentation devices that penetrate the structure and then explode inside are generally more effective" (p. 98). Mines, which are valuable defensive weapons in MOUT, must be small, easy to conceal, and hand-placed. Armored vehicles are highly mobile, but less effective in the urban environment than in open areas. Finally, FAEs provide an extremely powerful blast for concussion effect, by dispersing an explosive fuel into a vapor cloud over a target and then detonating the fuel.

An assessment of each weapon's utility in MOUT hinges upon the congruence between the weapon's critical attributes and the nature of the urban environment. As Special Text 90-10 (USAIS, 1979) acknowledges, "Plans for the use of weapons depend on knowing the variety of conditions in different sizes and types of cities" (p. 2-2). For example, "street width, line-of-sight distance, and angle of obliquity have a direct bearing on accuracy, range, and effectiveness of shoulder-carried assault weapons" (USAIS, 1979, p. 2-5). Further, in discussing weapons-related problems in MOUT, the U.S. Army Science Board Ad Hoc Group (1978) identifies the following problems (related to LAW, Dragon, TOW, etc.):

1. Arming distances are too great for MOUT.

2. Large caliber weapons suffer from overpressure and backblast.

3. Scatterable mines are ineffective.

4. Precision guided missiles are difficult to control properly.

Generally, factors such as sighting and arming distances, backblast and overpressure, firing signature, and penetrability are weapon characteristics that assume vital roles in urban warfare. As such, each factor merits more detailed attention.

In considering sighting distances, it is necessary to realize that in the short-range combat environment of MOUT, ranges are greatly reduced by structures, dust, and battle smoke. Clearly, highly skilled soldiers operating appropriate weapons are vital to military success in urban terrain. According to Mullen and Shank (1978), targets in MOUT are expected to be between the ranges of 30 and 50 meters Further, these researchers note that the M203 and M79 40mm grenade launchers, which have a range of 400 meters, are anti-personnel, high explosive projectile launchers used for building clearing

operations. While Mullen and Shank (1978) report that the weapons possess comparable accuracy, they observe that subjects using the M203 had to readjust their aim point occasionally during the test trials. Thus, they pose the question as to whether short-range indicators should be introduced on the sight. For MOUT, Mullen and Shank (1978) contend that "it appears that an emphasis on high first round P_E [probability of entry] would warrant short range indications of 35-40 meters" (p. 32). Also, the researchers suggest that the leaf sight, though not perfectly suited to MOUT, is preferable to the quadrant sight. In this regard, Mullen and Shank (1978) indicate that "the ideal improvement would be a redesigned leaf sight to include short-range (30 and 40 meters) and extended-range (to 400 meters) indices" (p. 35). Once the appropriate sighting distances are determined and incorporated into weapon systems, the arming distance issue must be resolved. Again, shorter distances are typical in MOUT and weapons must reflect this needed capability. The U.S. Army Science Board Ad Hoc Group (1978), for instance, maintains that fuses, with an arming distance of at least 200 feet, are inappropriate for combat on urban terrain. In general, they assert that "the current man-portable weapons are not well-suited to MOBA" (p. 90). Their concern represents the possible incompatability of two critical issues in MOUT: safety versus weapon utility. Thein (1980) argues that in evaluating any weapon for MOUT, it is necessary to consider "the ability to engage targets at close range which is a function of the munition's arming distance and sighting system" (p. 148). Unfortunately, these weapons may be most perilous for the soldier, especially if he is not trained to the necessary level of proficiency.

Another aspect of the MOUT-weapon relationship is backblast and overpressure. In discussing infantry anti-tank systems, Schecter (1977) cites these problems as contributing to their inappropriateness in MOUT. Specifically, Schecter (1977) posits that "the backblast of these systems will produce structural damage or physiological injury or impairment of gunner proficiency in confined areas. This leaves our infantrymen with no weapon capable of delivering a sizable payload while taking advantage of the protection found in built-up areas" (p. 59). Similarly, the U.S. Army Science Board Ad Hoc Group (1978), observing that large caliber manpack weapons entail considerable backblast and overpressure upon firing, recommends that modifications be made to reduce these characteristics.

Another difficulty associated with current weaponry in MOUT involves firing signature. Basically, the key problem is that many weapons provide information to the enemy regarding firing location. As Mahaffey (1980) indicates, weapon signatures can draw hostile fire, damage ear drums or lungs, and destroy the soldier's enclosure. Thus, MOUT presents an interesting dilemma: it is desirable to reduce backblast, overpressure, and firing signature; yet it is also important to have sufficient impact. In this regard, a consideration of penetrability in MOUT is warranted.

Discussing conventional warfare, Thein (1980) notes that the "philosophy has been that the greater the range capability, the better the weapon's effectiveness" (p. 148). With the short ranges of MOUT, though, she acknowledges a shift from attacking armored vehicles at long ranges to vertical walls at short ranges. Accompanying this shift in target is a new capability

requirement—from perforation of target material to the provision of usable holes. Schecter (1977) indicates that unfortunately, experimental data show "penetration at the very short ranges, typical of urban engagements, is very low" (p. 57). Further, he argues that a multi-shot rifle system generally offers no advantage over single shot systems. Schecter (1977) notes, though, that for the situation involving transient targets appearing at short ranges, with arming time a factor, multi-shot systems may be advantageous. At any rate, the ability to penetrate various structures in useful ways (e.g., wall breaching) is crucial to the success of MOUT.

According to the U.S. Army Science Board Ad Hoc Group (1978), the mortar is a major weapon in urban combat. Special Text 90-10 (USAIS, 1979) supports this contention: "Mortars are particularly well-suited for use in urbanized terrain because of their characteristic high trajectory" (p. 5-2). Further, Jureidini et al. (1979), analyzing the Lebanon conflict, conclude that anti-aircraft artillery (AAA) was an especially effective weapon on both sides when used in direct fire roles. Also, Special Text 90-10 (USAIS, 1979) notes that the use of anti-tank weapons, automatic weapons, hand grenades, and high explosive charges is extensive in MOUT. In this respect, it should be realized that a considerable amount of ammunition is used in urban combat situations. Special Text 90-10 (USAIS, 1979) indicates that these large quantities of ammunition are based upon the necessity of reconnaissance by fire due to short ranges of visibility. The specific ammunition employed includes demolitions, smoke, fragmentation grenades, as well as supplies for flame weapons, mortars, anti-tank weapons, and other crew-served weapons. It should be realized, however, that fewer tanks and tank ammunition are used as they are more vulnerable in MOUT. In this regard, the U.S. Army Science Board Ad Hoc Group (1978) reports that tanks are less effective in MOUT because they are susceptible to attack from above, have weak top armor, possess limited movement and visibility, are vulnerable to mines, and have limited firing angles.

Having examined the advantages and deficiencies of various weapon systems in MOUT, it is possible to identify weapon requirements that will help ensure success in urban combat. According to Gale (cited in Thein, 1980), "In order to conduct successful operations in a city, troops have to be equipped with close combat weapons, allowing them to fire at a minimum range; provided with ammunition and explosive charges to make breaches and holes in the walls of houses, storming ladders, ropes with grappling hooks, etc" (p. 14). Similarly, A. M. Gray, Jr. (1980) contends that ground units will need wall-breaching capabilities at less than 25 meters (without backblast), small arms ammunition to penetrate masonry and concrete structures, improved smoke and non-lethal hand grenades, FAEs, and demolition charges that can be projected. Further, he states that aviation units require increased stand-off ranges and lethality for conventional direct fire weapons against MOUT targets, shortened explosive times for anti-tank guided missile (ATGM) firings, and increased stand-off ranges for the release of precision guided munition. Similarly, Stone (1980) identifies the need for a short-range anti-tank weapon that can be fired from an enclosed space. Also, he advocates refining the capability to blow holes in walls and produce casualties. Here, Stone (1980) recommends greater reliance upon grenades and a more effective sniper weapon. Jureidini et al. (1979), noting that weapons are often unable to shift from one type of

ammunition to another, maintain that "ammunition versatility is an important asset in MOBA" (p. 55). Finally, Carlson (cited in Thein, 1978) suggests the necessity of an infantry assault weapon to neutralize personnel behind cover, provide breaching holes in walls, destroy bunkers, defeat light armored vehicles, and deliver a variety of warheads. In this respect, Bright (1980) claims that the Light Weight Recoilless Gun (LWRG) and the Minimum Signature Envelope Recoilless (MISER) are viable candidates for a MOUT assault weapon, as both weapons exceeded the stated requirement for hit probability in controlled test settings. Similarly, Baker (1980) identifies the Rifleman's Assault Weapon (RAW) as a suitable weapon, as it has low blast signature, zero ballistic loft to the target, and attaches to the M16A1 rifle.

In adapting existing weapons systems or developing new weapons for MOUT, it is instructive to consider the deficiencies exhibited by the current systems in the urban environment. As Weisz (cited in Thein, 1980) urges, it is important to consider MOUT in evaluating both present equipment and future developments. Further, the U.S. Army Science Board Ad Hoc Group (1978) notes that "as in the case of available weapons, the effectiveness of weapons under development and the human factors involved when used for MOBA must be evaluated" (p. 84). An important issue is the extent to which MOUT-specific weaponry should be developed. Guthrie (cited in Schecter, 1977) contends, "Realizing that special-purpose systems should be considered only as a last resort, we are obliged to examine critically our inventory and developmental items to search out opportunities for modifications and product improvement that will provide needed capabilities at minimum cost and without proliferation" (p. 108). In this context, the U.S. Army Science Board Ad Hoc Group (1978) concludes that "the Army has the resources within its own establishment to develop the field weaponry and equipment far better suited to the MOBA environment than the current inventory weapons" (p. 77).

According to Jureidini et al. (1979), "it has been found that there are no stated requirements for the operation of weapons or ammunition for military operations in built-up areas." (p. 75). Still, some MOUT researchers do allude to training needs for urban warfare. For example, the U.S. Army Science Board Ad Hoc Group (1978) suggests that the arming distance problem can be solved by training. Specifically, the Board believes troops can be trained in the use of small caliber weapons "under the short-range conditions allowing them to achieve the ability to easily estimate target ranges commensurate with aiming of the grenade" (p. 2). Here, aiming could be simplified by using a laser pointer to quickly project a spot on the intended targets. Another training-related discussion entails the comparison of the M203 and M79 40mm grenade launchers. Mullen and Shank (1978) recommend that "when the system dispersion errors (the grouping of impacts) are large compared to the target area, the gunner should fire several rounds before he adjusts his aim point" (p. 32). Further, they state that if high probability of hit is not required on the first round, adjustments in elevation should bring the center of impact on the opening within a few rounds, because the system dispersion errors are small compared to bias errors.

Any discussion of portability in MOUT must include a consideration of the soldier's apparel. For example, M. S. Gray (1980) legitimately questions whether a soldier in MOUT with a nuclear/biological/chemical (NBC) suit can accomplish the physical tasks demanded by the situation. Stone (1980) advocates the employment of lightweight, flexible body armor to enhance troop survival. Barron (cited in Thein, 1979) asserts that the Variable Armor Vest has the capability to protect against high velocity small arms (e.g., M16A1 rifle), which cause most casualties in urban combat.

The most comprehensive analysis of load bearing equipment is an HEL comparison of the human factors engineering of two Load Carrying Equipment (LCE) systems. Specifically, HEL (1977) examined the All-Purpose Lightweight Individual Carrying Equipment (ALICE) system and the Infiltrator Vest Combat System VII (IVCS). The basic difference between these systems involves the attachment/ packaging of ammunition and hand grenades. ALICE has a suspended belt which concentrates the fighting load around the waist, while IVCS is a fabric vest covering the upper torso, including the waist area. In the latter instance, the fighting load is attached directly to the vest. HEL's research design required soldiers to perform infantry tasks while wearing each system. In a silhouette analysis, they found that in the flat position, subjects wearing the ALICE system presented a lower silhouette than the IVCS. In a magazine test, extraction took longer for all positions on IVCS, and the outermost location on ALICE, than the rest of the ALICE system. HEL attributes this result to the presence of a closure device incorporated as part of the magazines, whereas on IVCS, each magazine has a cover flap requiring separate action. HEL observes that a trade-off exists between magazine retention/ security and extraction time. On a subjective evaluation, "subjects preferred the IVCS over the ALICE" (HEL, 1977, p. 39). They posit that the IVCS has the advantage of the load being balanced and evenly distributed, with minimum adjustments required after rapid movement. Conversely, this system is excessively hot and results in considerable perspiration. Overall, HEL indicates that the IVCS required less attention, in terms of monitoring gear position, than ALICE. Also, they state that "for both the IVCS and ALICE, there were fewer problems reported for common than for specialized equipment" (HEL, 1977, p. 48). They conclude that "the vest concept will always provide a more stable load, basically because the weight is distributed over a larger area of the torso" (p. 55). Still, HEL cautions that the IVCS, as currently designed, is not an acceptable one-for-one replacement for ALICE.

Another special equipment area involves sensors. As Mahaffey (1980) notes, sensors are equipment to see the battlefield, thereby permitting night observation and enhancing performance in reduced visibility situations. The U.S. Army Science Board Ad Hoc Group (1978), observing that open areas are rare and much concealment exists in the urban environment, examined various technologies for the location and identification of personnel, vehicles, and weapon systems. Nine technologies currently in the Army's inventory include radar, night vision/infrared technology, acoustic technology, laser/electro-optics technology, identification of friend or foe (IFF) technology, remotely piloted vehicle (RPV) technology, photography/photo-optics technology, unattended ground sensors/remote battlefield area surveillance technology, and mine/booby trap detection technology. Clearly, the human factors and training implications of these technologies must be considered in improving the Army's preparedness for urban combat.

Any discussion of portability in MOUT must include a consideration of the soldier's apparel. For example, M. S. Gray (1980) legitimately questions whether a soldier in MOUT with a nuclear/biological/chemical (NBC) suit can accomplish the physical tasks demanded by the situation. Stone (1980) advocates the employment of lightweight, flexible body armor to enhance troop survival. Barron (cited in Thein, 1979) asserts that the Variable Armor Vest has the capability to protect against high velocity small arms (e.g., M16A1 rifle), which cause most casualties in urban combat.

The most comprehensive analysis of load bearing equipment is an HEL comparison of the human factors engineering of two Load Carrying Equipment (LCE) systems. Specifically, HEL (1977) examined the All-Purpose Lightweight Individual Carrying Equipment (ALICE) system and the Infiltrator Vest Combat System VII (IVCS). The basic difference between these systems involves the attachment/ packaging of ammunition and hand grenades. ALICE has a suspended belt which concentrates the fighting load around the waist, while IVCS is a fabric vest covering the upper torso, including the waist area. In the latter instance, the fighting load is attached directly to the vest. HEL's research design required soldiers to perform infantry tasks while wearing each system. In a silhouette analysis, they found that in the flat position, subjects wearing the ALICE system presented a lower silhouette than the IVCS. In a magazine test, extraction took longer for all positions on IVCS, and the outermost location on ALICE, than the rest of the ALICE system. HEL attributes this result to the presence of a closure device incorporated as part of the magazines, whereas on IVCS, each magazine has a cover flap requiring separate action. HEL observes that a trade-off exists between magazine retention/ security and extraction time. On a subjective evaluation, "subjects preferred the IVCS over the ALICE" (HEL, 1977, p. 39). They posit that the IVCS has the advantage of the load being balanced and evenly distributed, with minimum adjustments required after rapid movement. Conversely, this system is excessively hot and results in considerable perspiration. Overall, HEL indicated that the IVCS required less attention, in terms of monitoring gear position, than ALICE. Also, they state that "for both the IVCS and ALICE, there were fewer problems reported for common than for specialized equipment" (HEL, 1977, p. 48). They conclude that "the vest concept will always provide a more stable load, basically because the weight is distributed over a larger area of the torso" (p. 55). Still, HEL cautions that the IVCS, as currently designed, is not an acceptable one-for-one replacement for ALICE.

Another special equipment area involves sensors. As Mahaffey (1980) notes, sensors are equipped to see the battlefield, thereby permitting night observation and enhancing performance in reduced visibility situations. The U.S. Army Science Board Ad Hoc Group (1978), observing that open areas are rare and much concealment exists in the urban environment, examined various technologies for the location and identification of personnel, vehicles, and weapon systems. Nine technologies currently in the Army's inventory include radar, night vision/infrared technology, acoustic technology, laser/electro-optics technology, identification of friend or foe (IFF) technology, remotely piloted vehicle (RPV) technology, photography/photo-optics technology, unattended ground sensors/remote battlefield area surveillance technology, and mine/booby trap detection technology. Clearly, the human factors and training implications of these technologies must be considered in improving the Army's preparedness for urban combat.

Tools for entering buildings are an especially important area of MOUT equipment. Mullen (1978) examined the comparative utility of the West German Stabru ladder with the traditional rope/grappling hook combination. The ladder is unconventional, compact in its disassembled mode, and can be emplaced from below. Mullen (1978) contends that the Stabru ladder is better than the rope/grappling hook in utility, operation, and placement; but it is more costly and less available. Further, these two special devices are equal in terms of maintainability and portability. Additionally, the ladder does not require the assistance of a second person, and possesses greater carrying capability than the rope/grappling hook. In his study, Mullen (1978) reports that subjects preferred the ladder over the grappling hook. He identifies two potential problems with the Stabru ladder, however, that warrant attention. First, most subjects had difficulty insuring a proper foothold on the rungs and experienced hand abrasions. Mullen (1978) suggests that this reflects a training problem and indicates that the abrasions were corrected during the study. Second, subjects encountered an occasional malfunction of the release mechanism. As such, Mullen (1978) recommends two improvements to the Stabru ladder. Specifically, he advocates having various interchangeable hooks (with a larger throat) and evaluating the ladder to determine the requirements for foldable standoffs.

A few other special equipment areas deserve consideration. Jureidini (1980), for example, recommends that medical kits be made more widely available. His justification is based primarily on the fact that medical evacuation is often impossible in MOUT. Special Text 90-10 (USAIS, 1979) suggests the provision of earplugs and goggles to ensure the soldier's safety. It also recommends providing nails, hammers, and saws to construct barriers/obstacles in urban terrain. Again, utility, portability, and maneuverability are important factors in equipping military personnel for MOUT.

Special Text 90-10 (USAIS, 1979) offers some insight into procedures for obtaining effective combat support. For example, the manual suggests prestocking end items, such as supplies, water, food, and ammunition. Also, it advocates dispersing and decentralizing combat service support systems, using host country support and civil resources whenever authorized and practicable. Finally, it acknowledges the need to provide for smaller, more numerous resupply loads due to the isolation of supported units and the reduced effectiveness of transportation in MOUT.

Training Engagement Simulation (TES) Training

TES simulates combat by establishing two-sided, free-play exercises between opposing forces in a manner that elicits behaviors similar to those actions expected in combat. TES has the following characteristics (Sulzen, 1979):

1. weapons firing signature,

2. weapons effects simulation,

3. near real-time casualty assessment,

4. free-play engagements by participants,

5. intelligent opposition attempting to thwart military goal directed behavior,

6. After Action Review (AAR) for training feedback, and

7. repetition of exercises to improve tactical proficiency.

A recently developed type of TES training incorporates MILES. The U.S. Army Training Support Center (ATSC, 1978) describes MILES as "a family of low-power, eye-safe lasers which will simulate the direct fire characteristics of the M16A1 rifle, the M60, M2, and M85 machineguns, the VIPER, DRAGON, TOW, and Shillelagh missle systems plus the 105 and 152mm tank main guns" (p. 13). Laser detection equipment is mounted on individuals and vehicles, providing immediate and accurate casualty assessment. In this manner, circuitry in the receptor determines the type of weapon fired and the resultant probability of kill based upon weapon fire power. Exercise controllers observe the action and report casualties, location, and time to a centralized net control station. The net control station collects controller information, tactical communication, and other information for later analysis and manual replay of the exercise. In addition to these features, MILES entails realistic ammunition expenditure and resupply. Also, this training system permits full participation and functioning of medical and individual replacement systems. In this respect, MILES extends TES to full company/team and battalion task force level training, including night operations (ATSC, 1978).

With the inherent capabilities of the MILES/TES approach for improved training, evaluation, and feedback, it has not been used in an organized fashion during MOUT training. MILES equipment is used in a somewhat ineffective fashion during MOUT training in the IOBC and some other courses at Fort Benning. However, it lack effectiveness because the real power of TES derives from the learning and confirmation that occurs within a properly conducted AAR, which is neither well understood nor performed in this training. MILES has also been used in some unit training exercises, notably at Fort Lewis; but again its implementation is not as efficient as it should be.

Basically, the Army has not begun to exploit the potential value of MILES for systematic MOUT training. To allow greater exploitation of TES in MOUT training, it will be necessary to better identify those tasks and missions for which MILES is best suited and to develop systematic approaches and scenarios which incorporate appropriate elements of MILES. It also will be necessary to develop and disseminate better guidance for the conduct of appropriate AARs at all levels of training. When these tasks have been accomplished, more can be determined about the MILES-MOUT relationship, and how this can best be exploited in institutional and unit training. With an appropriate application in proper settings, TES/MILES training could be extremely effective in teaching soldiers about critical aspects of MOUT fighting, such as the need for close combat skills and maximal use of cover and concealment within buildings. In summary, the full potential of TES/MILES for MOUT training remains untapped.

CONCLUSION AND RECOMMENDATIONS

Current MOUT training presents numerous researchable problems. For example, the demographic growth of West Germany since World War II has produced a situation in which the majority of any conflict fought in Central Europe is likely to occur in cities and towns. Although this is not a new or startling conclusion, when coupled with the limited training given to U.S. soldiers, it potentially becomes a problem of wide scope and severe consequences. The doctrine that determines where and when U.S. units will fight needs to be closely examined, with the object of determining the relative advantages and disadvantages inherent in the defense or attack of built-up areas. A scientific study to determine the advantage of defenders over attackers is within current research capabilities and would be of tremendous value to developers of U.S. doctrine.

Current Army standard maps, 1:50,000, are inadequate for MOUT planning and execution. This mapping scale cannot portray the level of detail needed to conduct successful operations. The need for greater detail is widely recognized; however, no U.S. activity was found to have corrected this deficiency. While the British Army in Berlin currently is testing a 1:4,000 scale map, a research project to determine the optimum map scale for portrayal of MOUT information should be conducted due to its tactical importance.

The addition of live fire MOUT training is needed to enhance current training and introduce a higher level of realism. As an illustration, the British Army has effectively introduced live fire training at their Cinque Ports training area. A research project in this area could determine the benefits and costs associated with live fire MOUT training. However, this would be a difficult area to investigate because few facilities currently permit live fire MOUT training.

Leaders need to be more familiar with the precepts of urban terrain analysis. Cursory treatment of this topic is provided to IOBC and ANCOC students. IOAC and IPCC students receive more instruction, but it could be improved and expanded. An excellent instructional aid is available in Ellefsen et al. (1981). The amount and type of instruction needed by personnel at various levels is currently not known. Research in this area is of great tactical importance at all levels, from the machinegunner selecting a firing position because of better cover to the battalion commander assigning weapons positions based upon considerations for building construction.

Soldiers Manual tasks on MOUT should be developed and included on SQTs for all infantry soldiers. Further, critical MOUT tasks should be included in OSUT end-of-course testing. At present, seven to ten tasks are being developed by USAIS. Unfortunately, this is far short of the comprehensive task analysis of MOUT that is required; but it is a step in the right direction. Although conducting a detailed task analysis would be a labor intensive effort, it could provide immeasurable help to the training development community.

The use of MILES equipment appears to be of great value in reinforcing appropriate combat behavior in MOUT training. Although the potential of MILES has just begun to be recognized in MOUT training, a real need exists to determine the most appropriate means for incorporating MILES into this training. Greater realism and increased training effectiveness could result from an endeavor in this direction.

Snipers can have a tremendous impact upon the outcome of an urban battle. The use and employment of snipers in MOUT has not been explored or exploited by the U.S. Army. Determining the appropriate role of snipers in both offensive and defensive MOUT operations is within current research and development capabilities, and it could have a significant impact upon subsequent training.

Command and control procedures may be adequately covered in doctrine. However, very few exercises are conducted to familiarize the commander and staff with the complex problems unique to MOUT or to confirm the adequacy of doctrine through practice. A need exists to develop appropriate training exercises in MOUT for commanders and their staffs. Actual command post or field exercises could be developed for the conduct and evaluation of comprehensive MOUT training scenarios.

Due to limited MOUT training facilities and the limited time available for training in these facilities, more emphasis should be placed upon related training outside of MOUT facilities. In every training exercise observed, over half of the time allotted was devoted to individual skills training. Many of these skills could be taught and practiced in the unit, and in conjunction with other types of training. In order to make maximum use of the limited facilities available, those tasks that could be perfected before moving to a MOUT facility should be clearly identified. Such a comparatively straightforward project could have invaluable impact upon U.S. Army training.

Some current infantry weapons are not practical for MOUT. This is especially true of anti-tank weapons with long arming distances. In addition, the infantryman presently does not have a weapon that can be used to breach walls. U.S. units in Berlin still use the 90mm recoilless rifle as a MOUT weapon. Few effective alternatives exist, since a new and better breaching weapon has yet to be developed. The identification of weapons needed for the accomplishment of various MOUT tasks would require extensive weapons research, involving every weapon from the M16A1 rifle to the M1 tank.

Equipment needs of the individual soldier must be evaluated. This evaluation would include communications, NBC, body armor, sensors, night vision devices, and special tools. This evaluation should identify those items that are needed and where they are to be stored. It was recognized by all units observed that special equipment plays an important role in MOUT, but no visible stocking or issuing of such equipment had been made.

Finally, the use of MOUT simulation may be a cost-effective alternative training method and should be further explored. The growth of high technology, in such areas as interactive videodisc and microprocessing, has resulted in new and exciting possibilities for MOUT training.

REFERENCES

Baker, A. Rifleman's assault weapon (RAW). American Defense Preparedness Association International Symposium on Military Operations in Built-up Areas. Adelphi, Maryland: U.S. Army Human Engineering Laboratory, December 1980.

Bright, J. L. ARRADCOM assault weapon for MOUT. American Defense Preparedness Association International Symposium on Military Operations in Built-up Areas. Adelphi, Maryland: U.S. Army Human Engineering Laboratory, December 1980.

Department of Army Field Manual 90-10. Military operations on urbanized terrain (MOUT), August 1979.

Department of Army Field Manual 90-10-1. An infantryman's guide to urban combat (draft), September 1980.

Ellefsen, R., Carlson, A., Tehin, B., Milligan, N., Lein, J., & Kanemoto, A. Urban terrain analysis training aids. U.S. Army Human Engineering Laboratory Technical Memorandum 14-81, September 1981.

Fuller, J. F. C. A military history of the western world (Vol. 3). New York: Funk and Wagnalls, 1956.

Gray, A. M., Jr. How we felt: U.S. Marine Corps presentation. American Defense Preparedness Association International Symposium on Military Operations in Built-up Areas. Adelphi, Maryland: U.S. Army Human Engineering Laboratory, December 1980.

Gray, M. S. Urbanization of combat terrain. American Defense Preparedness Association International Symposium on Military Operations in Built-up Areas. Adelphi, Maryland: U.S. Army Human Engineering Laboratory, December 1980.

Hayes, M. Tactical mapping systems (TACMPS). American Defense Preparedness Association International Symposium on Military Operations in Built-up Areas. Adelphi, Maryland: U.S. Army Human Engineering Laboratory, December 1980.

Jureidini, P. A. Case study: Beirut combat. American Defense Preparedness Association International Symposium on Military Operations in Built-up Areas. Adelphi, Maryland: U.S. Army Human Engineering Laboratory, December 1980.

Jureidini, P. A., McLaurin, R. D., & Price, J. M. Military operations in selected Lebanese built-up areas, 1975-1978. Aberdeen Proving Ground, Maryland: U.S. Army Human Engineering Laboratory, June 1979.

Mahaffey, F. K. Equipment requirements. American Defense Preparedness Association International Symposium on Military Operations in Built-up Areas. Adelphi, Maryland: U.S. Army Human Engineering Laboratory, December 1980.

Mullen, W. C. Evaluation of the Stabru ladder for use in military operations in built-up areas. Aberdeen Proving Ground, Maryland: U.S. Army Human Engineering Laboratory, October 1978.

Mullen, W. C., & Shank, E. B. The use of the 40mm grenade launcher in a MOBA environment. Aberdeen Proving Ground, Maryland: U.S. Army Human Engineering Laboratory, July 1978.

Rand McNally. (1981). World atlas. Chicago: Author.

Rigby, J. C. B. United Kingdom program. American Defense Preparedness Association International Symposium on Military Operations in Built-up Areas. Adelphi, Maryland: U.S. Army Human Engineering Laboratory, December 1980.

Schecter, G. Technology program for military operations in built-up areas (MOBA). Aberdeen Proving Ground, Maryland: U.S. Army Human Engineering Laboratory, August 1977.

Stone, H. F. Ninth Infantry Division program. American Defense Preparedness Association International Symposium on Military Operations in Built-up Areas. Adelphi, Maryland: U.S. Army Human Engineering Laboratory, December 1980.

Sulzen, R. H. Simulated combat training as an approach to effective military performance. Paper presented at the annual meeting of the National Society for Performance and Instruction, April 1979.

Thein, B. K. Third DARCOM-TRADOC coordination conference on MOBA. Aberdeen Proving Ground, Maryland: U.S. Army Human Engineering Laboratory, August 1978.

Thein, B. K. Fourth DARCOM-TRADOC coordination conference on MOBA. Aberdeen Proving Ground, Maryland: U.S. Army Human Engineering Laboratory, February 1980.

U.S. Army Human Engineering Laboratory. (1977). Human factors engineering assessment of the infiltrator vest combat system VII (IVCS). Aberdeen Proving Ground, Maryland: Author.

U.S. Army Infantry School Special Text 90-10. An infantry commander's guide for military operations on urbanized terrain (MOUT), June 1979.

U.S. Army Infantry School Subcourse 0354-9. Military operations on urbanized terrain.

U.S. Army Infantry School and U.S. Army Infantry Center Program of Instruction 7-11 B/C/H. Program of instruction for one station unit training (Infantry), October 1981.

U.S. Army Science Board Ad Hoc Group. Military operations in built-up areas, July 1978.

U.S. Army Training Support Center Pamphlet 41612-78. Tactical engagement simulation: Experiential learning, 1978.

Weisz, J. D. Training methods and requirements. American Defense Preparedness Association International Symposium on Military Operations in Built-up Areas. Adelphi, Maryland: U.S. Army Human Engineering Laboratory, December 1980.

Whittenburg, J. A., Mietus, J. R., & Sterling, B. S. MOUT ARTEP evaluator training (working paper). ARI, USAREUR Field Unit, January 1980.

Wood, C. G., Rowland, D., and Thody, J. H. Kings Ride V: A concept paper on trials of close combat in built-up areas. Defence Operational Analysis Establishment Working Paper 662/1, United Kingdom Ministry of Defence, 1982.

APPENDIX A

MULTIPLE CHOICE TEST ON MOUT ADMINISTERED TO OSUT STUDENTS AND INSTRUCTORS

The following multiple choice questions concern your familiarity with skills or tasks relevant to Military Operations on Urbanized Terrain (MOUT). Please circle the letter corresponding to the response of your choice.

1. Various means such as ladders, drain pipes, vines, helicopters, or the roofs and windows of adjoining buildings may be used to reach the _____ or _____ of a building.

   a. top floor ... roof
   b. second story ... mousehole
   c. stairway ... doorway

2. By attaching a _____ to the end of a rope, a rifleman can scale a wall or gain entrance through an upstairs window.

   a. cable
   b. wire
   c. grappling hook

3. When using a grappling hook, insure that the hook has a _____ before beginning to climb.

   a. anchor knot
   b. solid hold
   c. slip knot
   d. half hitch

4. How many seconds should a grenade be allowed to "cook off"?

   a. 3 seconds
   b. 10 seconds
   c. 5 seconds
   d. 2 seconds

5. The rifle squad is divided into two teams when organized for combat in urban operation, a support team and an assault team. What is the mission of the assault team?

   a. provide security
   b. entering and clearing buildings
   c. attacking a building

6. What should be done to windows when preparing a building for defense?

   a. barricade all of the windows
   b. barricade only the windows from which you intend to fire
   c. cover the windows with sandbags
   d. nothing should be done to the windows

7. When exiting a doorway of a building, it is done in a _____ manner, keeping a _____ silhouette.

   a. slow ... high
   b. rapid ... low
   c. moderate ... medium
   d. none of the above

8. When moving past a ground floor window, you should be _____.

   a. standing in window
   b. above window level
   c. below window level

9. In clearing a building, the best method is _____.

   a. bottom to top
   b. front to rear
   c. top to bottom
   d. rear to front

10. When throwing a grappling hook, you should stand _____.

    a. as close to the building as possible
    b. as far away from the building as possible
    c. to the left of the building
    d. to the right of the building

11. After clearing a room, as an assault team member, you should _____.

    a. leave a member of your team at the cleared room for security
    b. board the windows and doors of the cleared room to prevent entry
    c. mark the cleared room
    d. notify the support team so they can mark the cleared room

12. When firing from behind a wall, you should fire _____ cover when possible.

    a. around
    b. over
    c. underneath
    d. none of the above

13. When entering a lower-story window using a two-man support lift, the _____ man should be lifted through the window first.

    a. shortest
    b. heaviest
    c. tallest
    d. lightest

14. When firing from around the left corner of a building, you should fire your weapon from _____ shoulder.

a. your right
b. your left
c. either

ANSWERS

1.	a	8.	c
2.	c	9.	c
3.	b	10.	a
4.	d	11.	c
5.	b	12.	a
6.	a	13.	b
7.	b	14.	b

Left side –
leave blank

APPENDIX B

RESULTS OF PERCEPTION OF MOUT TRAINING QUESTIONNAIRES
ADMINISTERED AT FORT BENNING

Results of Questionnaire Administered to OSUT Students

I. Instruction

- How well prepared were your instructors for the MOUT training?

0%	1%	11%	36%	52%
very poorly	poorly	moderately	well	very well

2. How often did you understand the instructions?

1%	3%	6%	34%	56%
very rarely	rarely	sometimes	often	very often

List any tasks for which the instructions were confusing, and indicate what was not clear.

3. How often were you given feedback about your performance?

16%	26%	28%	22%	8%
very rarely	rarely	sometimes	often	very often

4. To what extent was the feedback helpful?

13%	13%	24%	29%	21%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

II. Benefit from Training

5. How much will MOUT training help you to fight better?

0%	4%	12%	46%	38%
very little	little	some	much	very much

6. How much did you learn from the MOUT training?

0%	2%	13%	54%	31%
very little	little	some	much	very much

7. How many new skills did you learn?

3%	3%	41%	40%	13%
none	few	some	many	very many

8. How many MOUT skills/tasks presented today could you perform correctly if you were given a test?

0%	2%	8%	44%	47%
none	very few	some	many	all

Which skills/tasks do you feel you could not perform correctly?

9. During attack and clear operations, how well did your squad work together?

0%	7%	17%	40%	36%
very poorly	poorly	moderately	well	very well

III. Time Management

10. To what extent were you given enough time to practice each task?

6%	20%	35%	30%	9%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

11. How often were you busy during MOUT training?

0%	3%	10%	53%	34%
very rarely	rarely	sometimes	often	very often

IV. Realism

12. To what extent was the MOUT training like combat?

2%	13%	49%	27%	10%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

V. Interest

13. To what extent would you like more MOUT training?

2%	2%	24%	36%	37%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

What training should be added? Eliminated?

Results of Questionnaire Administered to OSUT Instructors

I. Instruction

1. As an instructor, how well prepared were you to conduct MOUT training?

0%	0%	0%	33%	67%
very poorly	poorly	moderately	well	very well

2. How often did the trainees understand the instructions?

0%	0%	0%	33%	67%
very rarely	rarely	sometimes	often	very often

3. How often did you give feedback to the trainees about their performance?

0%	0%	17%	33%	33%
very rarely	rarely	sometimes	often	very often

4. To what extent was performance feedback helpful to the trainees?

0%	0%	33%	33%	33%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

II. Benefit from Training

5. How much do you think MOUT training will improve the trainees' abilities to perform their combat duties?

0%	0%	17%	17%	67%
very little	little	some	much	very much

6. How much do you think the trainees learned?

0%	0%	50%	17%	33%
very little	little	some	much	very much

7. How many new skills were presented to the trainees during MOUT training?

0%	17%	33%	33%	17%
none	few	some	most	all

Which skills/tasks could the trainees not perform correctly?

8. How many MOUT skills/tasks presented today could the trainees perform correctly?

0%	0%	33%	67%	0%
none	very few	some	most	all

9. During attack and clear operations, how well did the squads work together?

0%	0%	67%	33%	0%
very poorly	poorly	moderately	well	very well

III. Time Management

10. To what extent were the trainees given enough time to practice each task?

17%	0%	0%	33%	17%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

Which tasks, if any, need more practice?

11. How often were the trainees busy during this MOUT training?

0%	0%	0%	33%	67%
very rarely	rarely	sometimes	often	very often

IV. Realism

12. To what extent does the MOUT training give the trainees the "feel" of combat?

0%	0%	50%	0%	50%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

13. To what extent did you have the resources (for instance, people, equipment, and training area) necessary for realistic training?

0%	33%	50%	17%	0%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

List anything you feel would improve training realism.

V. Additional Training

14. To what extent is more training needed?

0%	0%	50%	33%	17%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

APPENDIX C

RESULTS OF PERCEPTION OF MOUT TRAINING QUESTIONNAIRE
ADMINISTERED AT FORT CAMPBELL

I. Instruction

1. How well prepared were you for the MOUT training?

5%	5%	46%	19%	24%
very poorly	poorly	moderately	well	very well

2. How often did you understand the mission?

0%	5%	14%	46%	35%
very rarely	rarely	sometimes	often	very often

3. How often were you given feedback about your performance?

5%	16%	22%	32%	21%
very rarely	rarely	sometimes	often	very often

4. To what extent was the feedback helpful?

5%	11%	49%	16%	19%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

II. Benefit from Training

5. How much will MOUT training help you to fight better?

3%	5%	16%	38%	36%
very little	little	some	much	very much

6. How much did you learn from the MOUT training?

8%	11%	35%	24%	22%
very little	little	some	much	very much

7. How much new skills did you learn?

30%	14%	41%	11%	5%
none	few	some	many	very many

8. How many MOUT skills/tasks could you perform correctly if you were given a test?

0%	8%	22%	49%	22%
none	very few	some	most	all

Which skills/tasks do you feel you could <u>not</u> perform correctly?

9. During attack and clear, how well did your squad/platoon work together?

0%	11%	43%	26%	20%
very poorly	poorly	moderately	well	most

III. Time Management

10. To what extent were you given enough time to practice each task?

0%	24%	41%	16%	5%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

11. How often were you busy during MOUT training?

0%	3%	22%	43%	32%
very rarely	rarely	sometimes	often	very often

IV. Realism

12. To what extent was the MOUT training like combat?

3%	28%	42%	22%	6%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

V. Interest

13. To what extent would you like more MOUT training?

5%	3%	43%	32%	16%
to a very small extent	to a small extent	to some extent	to a large extent	to a very large extent

APPENDIX D

MOUT TRAINING IN WEST BERLIN

During the trip to West Berlin, the observers were sponsored by the Berlin Brigade, the U.S. contingent of the "Four Powers" (U.S., British, French & Russian) that occupy Berlin. There are two major MOUT facilities located in West Berlin: Doughboy City - the U.S. facility, and Ruhleben - the British facility. Both of these facilities were visited. In addition to the facilities, an interview was conducted with a Regimental Commander of the French contingent. In summary, the observers received a first-hand view of MOUT training and concerns in West Berlin.

If hostilities break out in Europe, a MOUT battle will likely take place in Berlin. All forces stationed in West Berlin conduct extensive MOUT training, much more so than comparable units outside of Berlin. The facilities located in West Berlin are dedicated primarily to the training of the tenant units. The U.S., British, and French spend three weeks per company per year conducting individual and small unit MOUT tactics. In addition to this training, numerous battalion, brigade, and joint MOUT exercises are conducted annually. These include both field training and command post exercises. Since the units located in West Berlin are expected to fight there, it is assumed that extensive staff planning for MOUT battles is also conducted.

Both MOUT facilities located in West Berlin are utilized daily by the three Western Allies. The U.S. facility is also utilized annually by 15 U.S. Companies from West Germany. This heavy usage implies that the units stationed in Berlin may be the best MOUT-trained troops available. One point that must be noted is that this usage is not limited only to combat units, but includes combat support, combat service support, and allied units as well.

At the present time, the bulk of U.S. Army MOUT training is conducted solely within infantry units. However, both rear area troops and front line troops need MOUT training. In fact, with the existence of enemy airborne and infiltration capability, rear area troops located in towns and villages behind the front probably will be more likely to conduct defensive MOUT operations than front line troops. In addition, the possibility of ambushes or roadblocks to supply routes in cities and towns, requiring offensive MOUT operations, is a real and present danger. These factors illustrate the need for a comprehensive MOUT training program which can be applied throughout the U.S. Army.

Due to its unique mission to defend Berlin, the Berlin Brigade has written extensive training material for MOUT. This material includes a locally produced manual, Training for the Urban Battle (1978); a MOUT ARTEP, USCOB/USAB Pamphlet 350-2 (Jan 82); programs of instruction for visiting units, USCOB/USAB Pamphlet 350-1 (Mar 82); and numerous other training scenarios and exercises. In the Training for the Urban Battle manual, the Berlin Brigade has developed a 5-day, 52.5-hour POI for company MOUT training. An extract from this manual that presents the highlights of their training program is reprinted in the following section.

EXTRACT FROM TRAINING FOR THE URBAN BATTLE: PERSPECTIVE ON THE URBAN BATTLEFIELD

The mission to fight to seize or to hold urban terrain may well be the toughest task facing the company team on the modern battlefield. The broader planning considerations allowed brigade and higher headquarters will permit complexes of urban terrain to be addressed and the full range of modern mobility and fire power to be considered. At the company team level, certain urban terrain will have to be attacked or defended without recourse to larger scale planning flexibility, under conditions which limit the effects of our sophisticated weapons, and with the severest constraints on command and control. It is within the confines of this battle area that this training program introduces the tasks and combat skills for the soldier and his team members at squad, platoon, and company level to fight, win and survive.

In the hardest view, urban terrain will be characterized by a complex of winding, narrow streets and closely nestled buildings which canalize the attacker and restrict his observation. Alleys and sidestreets off main thoroughfares will be the source of ambushes or flanking attacks. As the attacker turns to meet threats to his flanks, his control of fires into adjacent, friendly sectors may be impaired. If the buildings in this typical sector are of concrete or brick, the advantage to the defender in "strong pointing" them is high. If sewers or other underground passages exist, an entire battle may take place there to avoid the destruction of the force by flying glass, fragments and shrapnel that cover the open areas above ground. As the battle intensifies, the destruction of buildings will serve to further restrict the mobility of the attacker and tighten the position held by the defender. For both sides, the ability to command and control will rapidly cease to exist and the force which wins will truly be that manned by the toughest and best trained soldiers.

It is from this portrayal of the urban battlefield that several of the most dominant conditions are identified and established as a foundation for this training program.

1. Command and control in urban terrain will be difficult whether it be as simple as signals between adjacent rooms in a building or as complex as continuing a battle over the rubble of destroyed structures which have lost any resemblance to the map planning or reconnaissance conducted at the start of the battle. Soldiers and units at all levels will operate independently with only mission type operations orders and without continuous communications to higher headquarters.

2. In urban warfare, destruction means rubble and hence obstacles which will favor the defender in strengthening his defense and will likewise hurt the attacker by lessening his mobility.

3. Limited mobility in urban terrain dictates that the soldier will more often than not have only what he can carry. Combine this with the crawling and climbing necessary in urban terrain, and it is clear that the soldier's stamina and upper body strength will be taxed severely, perhaps above that expected in open terrain.

4. As the battle approaches the heart of the urban area, the effects of various weapons must be reexamined:

a. The advantages of longer range become less important.

b. The ability to control indirect fire becomes uncertain.

c. The danger of shooting into friendly sectors becomes a major problem.

5. In the most fundamental sense, the best defense will be one which provides depth so that the shock of a superior attacker may be absorbed and he exhausts his combat power over planned obstacles-covered by fire-and the growing rubble created as the battle intensifies. The best offense will be characterized by rapid deployment which denies the defender time to prepare barriers and obstacles. The rapid exploitation of the offense along main routes will isolate strong points and fragment the defense - leaving the defender to sit ineffectively and subjecting him to systematic destruction. A prerequisite for the defender will be to select those tough pieces of urban terrain which canalize the attacker and reduce his effective combat power. For the attacker, he must prepare for battle using all elements of secrecy and deception to gain surprise.

6. At company team level and below the organic weapons and equipment will be sufficient to fight effectively on urban terrain. Therefore, success depends not upon equipment which the attacker may use to deploy rapidly or which the defender may use to build obstacles and barriers, rather success is a matter of time and imagination. These qualities come in part from training that leads to knowledge and confidence on the urban battlefield and the adaptation of basic fighting skills to that battlefield.

In light of these considerations, and since the likelihood of combat in an urban environment has increased significantly over the past three decades; there is a definite need for increased emphasis on training for urban fighting. It is with this in mind that this training packet was developed.

Purpose

The purpose of this Program of Instruction (POI) is to provide a usable training program which will be instrumental in closing the gap in the area of urban fighting at the company level in Military Operations on Urban Terrain (MOUT).

Many new publications are forthcoming which will emphasize the need for training to fight in the urban environment. TRADOC has recognized the need to cope with this new dimension on the future battlefield and is currently working on training publications which will aid in eliminating this gap.

This POI has identified through practical application and testing those basic skills and techniques required to become proficient in fighting in an urban environment. Through the application of this POI, the soldier with no

previous training in urban fighting should become basically proficient in these techniques and skills. Advanced proficiency can be realized as the POI is expanded based on the recommendations mentioned in the "General Instructions" portion of this package.

Scope

As described in the purpose statement, the aim of this POI is not to make every soldier an expert in urban fighting. It is intended, however, to familiarize the soldier with those skills and techniques of urban fighting that assist him in performing his functions as a member of a squad/platoon/company in an urban environment. The POI is not the document for solving all the training problems in this area. It is, however, a workable program that can be implemented now and in the future for any unit in the Army regardless of its location. It is not a theoretical proposal that "Think-tankers" have produced that may or may not work in the field. This program has been tested over several years by the U.S. Army Berlin in its Combat-In-Cities Visiting Unit program has proven its worth.

This POI is a complete package, ready for implementation now. This package is designed to be implemented by leaders at every level of command from the battalion through company and platoon. Additionally, the POI can be implemented either wholly as written, or gragmented by training days or instructional blocks with a high assurance of producing the desired training results.

General Instructions

1. Using the Program of Instruction.

This POI is designed around a five (5) day Monday through Friday week. The POI calls for 52.5 hours of actual instruction time, exclusive of administrative time. The POI has 17.0 hours of night training which is 32% of the overall POI. The POI follows a logical step-by-step sequence of training utilizing the "building block" technique wherein the premise is that the foundation (individual soldier skills) must be mastered before completing the remainder of the program (squad/platoon/company techniques). Therefore, the POI covers squad skills/techniques, platoon and company team techniques. A dedicated execution of this POI will produce soldiers who can fight in an urban environment and accomplish their missions.

2. Variations on the POI.

This POI was designed considering the real world problems and commitments that face the commander. It may not be possible to devote a week to executing this POI. In that case, the POI can be executed by training day and completed in this manner. When less training time is available, the POI can (but less desirably) be implemented by instructional blocks (lessons). Each lesson plan has a separate inclosure entitled Instructions to Leaders which must be consulted for detailed explanation of the execution of that instructional

block. Those instructional blocks, which lend themselves to individual expansion, are so indicated in the "Special Instructions" of the Instructions to Leaders inclosure.

Suggested expansion of the basic POI are:

a. Day 2. The round-robin training stations can be augmented with additional stations consisting of armor training (i.e., tank confidence course), aviation training (i.e., stabo training or aerial rappelling), SCOPES training (i.e., prep for utilization of SCOPES in Squad attack and defense blocks of instruction), and medical training (i.e., casualty evacuation, first aids, etc.).

b. Day 5. The company/team offensive and defensive operations can be conducted utilizing an opposing force provided by another company, other variations can be made as the trainers deem appropriate but should be keyed to track continuously with the rest of the POI.

3. Using the Training Schedule.

The training schedule was developed using a standard eight to five training day. The times indicated on the training schedule reflect actual training times based on the above considerations. Each unit utilizing this package should use this training schedule as a model or format and inject actual times and locations on the schedule as appropriate. Administrative times for movements not otherwise indicated must be included. The training schedule must be tailored to coincide with the daylight/nightfall factors and adjusted accordingly.

4. Preparing Unit Leaders.

Careful leader preparation is essential to achieve unit proficiency in urban fighting skills and to derive maximum benefit from the POI. Two areas - doctrinal study and an appreciation of special human factors - must be addressed prior to the conduct of training.

The start point is a preliminary study of MOUT doctrine. In particular, the video-cassette tapes referenced in the first two classes of the POI are a profitable point of departure. After review of the tapes, a study of basic doctrinal reference is necessary. These references are:

a. FM 31-50, Combat in Fortified and Built-Up Areas.

b. TC 7-1, The Rifle Squads (Mechanized and Light).

c. FM 7-7, Mechanized Infantry, Platoon and Squad.

d. The Infantry School's Combat-In-Cities Report, Vol I-III, 1972.

Next, leaders at all levels must be aware of the special conditions under which the individual soldier will train and, potentially, fight. The soldier will be required to operate independently without detailed instructions or

supervision by his chain of command. Leaders must strive to develop a confident mental attitude in each soldier and set a positive leadership example. Safety considerations must be emphasized. Since many engagements will be unexpected and at close range, all weapons must be fired with blank adapters.

Given the above steps, leaders are ready to begin the detailed selection and preparation of the training site for assigned classes. Specific Instructions to Leaders accompany each lesson plan and provide details to assist the instructor in the preparation of classes. (Note: Lesson plans and Instructions to Leaders must be used together.)

5. Selection of an Urban Training Site.

The fundamental prerequisite for urban training and the use of this POI is the selection of an adequate training site. Unquestionably, local resources will dictate the site; however, the following guidelines are suggested:

a. A complex of 12-15 buildings with a frontage of 400 meters and a depth of 200 meters. Multiple story buildings are necessary. A mixture of one through four-story buildings and an underground tunnel/sewer complex are among the most desirable characteristics of a good training area.

b. The site should permit multiple approach routes from wooded or open terrain to the complex.

c. When the site is semi-permanent, buildings should be improved with use of Property Disposal Office (PDO) furniture and target cloth for curtains. Car bodies, boards and bricks can be added to simulate the rubble likely to be found in the battle area.

An off-post site of unused apartment buildings or warehouses is the most realistic. However, a complex of abandoned barracks on-post may be more accessible. If no other facilities exist, the unit's billet area may be considered with obvious constraints on preparation of positions.

TRAINING OBJECTIVES

A. TRAINING OBJECTIVE

TASK: Demonstrate proficiency in offensive and defensive tactical operations in an urban environment.

CONDITIONS: Given a dismounted/mechanized infantry company/team, personnel and equipment at 100%, and an operational mission to conduct operations in an urban area.

TRAINING STANDARD: Offensive and defensive operations at the squad, platoon and company/team level must utilize proper techniques and procedures as outlined in FM 31-50.

B. INTERMEDIATE TRAINING OBJECTIVES

Intermediate Training Objective 1

TASK: Demonstrate techniques and procedures for urban fighting.

CONDITIONS: As a dismounted infantryman with the normal complement of equipment and ammunition, while engaged in fighting in a built-up area, and utilizing standard supply items or available field expedient construction materials.

TRAINING STANDARD: Individual must demonstrate sufficient familiarity and efficiency with urban operation techniques and procedures in accordance with FM 31-50, to include as a minimum:

1. Techniques and procedures for maneuvering in streets, alleys and through building networks.

2. Techniques and procedures for clearing buildings to include use of rappelling and grappling hooks, etc.

3. Knowledge in selection of firing positions for rifleman, automatic weapons and antitank weapons for both offensive and defensive operations.

4. Knowledge of placing demolitions for the destruction of buildings, bridges, barriers and obstacles; and the knowledge of placing demolitions to provide barriers and obstacles against the enemy.

Intermediate Training Objective 2

TASK: Assault and secure designated key buildings and defend on order.

CONDITIONS: As a dismounted squad with the normal complement of equipment and ammunition, while engaged in fighting in a built-up area, and utilizing standard supply items or available field expedient construction materials.

TRAINING STANDARD: Squad must demonstrate sufficient familiarity and proficiency with urban operation techniques and procedures in accordance with FM 31-50, to include as a minimum:

1. Techniques and procedures for maneuvering as a squad/fire team in streets, alleys and through building networks.

2. Techniques and procedures for clearing buildings to include systematic organization for clearance, marking of cleared rooms/ buildings.

3. Knowledge in selecting and organizing squad firing positions during the offense and particularly defensive operations.

4. Acceptable knowledge of use of demolitions to aid in the successful accomplishment of the squad's mission, offense and defense.

5. Knowledge of techniques for operating with tanks in the offense and defense and special considerations required for the tanks.

Intermediate Training Objective 3

TASK: Assault and secure a specified portion of a city and defend in the given area.

CONDITIONS: As a dismounted platoon with the normal complement of equipment and ammunition, while engaged in fighting in a built-up area and utilizing standard supply items or available field expedient construction materials.

TRAINING STANDARD: Platoon must demonstrate a minimum proficiency in MOUT techniques to include as a minimum:

1. Platoon leader's ability to plan for and execute successfully, offensive and defensive operations including proper utilization of all organic and attached supporting weapons.

2. Correct utilization of squads to accomplish the assigned mission in the most direct and tactically sound scheme of maneuver.

Intermediate Training Objective 4

TASK: Assault and secure a village (of appropriate size) or a specified portion of a large city, and defend in the given area.

CONDITIONS: As a dismounted company team with the normal complement of equipment and ammunition, while engaged in fighting in a built-up area and utilizing standard supply items or available field expedient construction materials.

TRAINING STANDARD: Company team must demonstrate a minimum proficiency in MOUT techniques to include, as a minimum:

1. Commander's ability to plan and execute successfully, offensive and defensive operations including proper utilization of all organic weapons.

2. Correct utilization of platoons to accomplish the assigned mission by using the most direct and tactically sound scheme of maneuver.

DAY	TIME	LOCATION	SUBJECT
1st Day	0800-1130	Classroom	General introduction to MOUT training
	1130-1300	Unit Area	Lunch
	1300-1600	Urban Area	Urban terrain walk (analysis of city)
2nd Day	-0800	DSG Route	Movement to training site
	0800-1200	TRNG Site	Individual techniques (round robin)
	1200-1300	TRNG Site	Lunch
	1300-1500	TRNG Site	Individual techniques (round robin)
	1500-	DSG Route	Movement to home station
3rd Day	-0800	DSG Route	Movement to training site
	0800-1000	TRNG Site	Squad movement technique
	1000-1300	TRNG Site	Squad entry/clearing and defensive technique (day)
	1300-1400	TRNG Site	Lunch
	1400-1700	TRNG Site	Squad entry/clearing and defensive technique (day)
	1700-1800	TRNG Site	Dinner
	1800-2200	TRNG Site	Squad entry/clearing and defensive technique (night)
	2200-	DSG Route	Movement to home station
4th Day	-0800	DSG Route	Movement to training site
	0800-1600	TRNG Site	Platoon offensive & defensive ops (day)
	1600-1700	TRNG Site	Dinner
	1700-2300	TRNG Site	Platoon offensive & defensive ops (night)
	2300-	DSG Route	Movement to home station
5th Day	-0800	DSG Route	Movement to training site
	0800-1200	TRNG Site	Co/Tm offensive ops (day)
	1200-1600	TRNG Site	Co/Tm defensive ops (day)
	1600-1700	TRNG Site	Dinner
	1700-2000	TRNG Site	Co/Tm offensive ops (night)
	2000-2300	TRNG Site	Co/Tm defensive ops (night)
	2300-	DSG Route	Movement to home station

TRAINING FOR THE URBAN BATTLE: PROGRAM OF INSTRUCTION

	SUBJECT	HOURS
1.	Basic Offensive Operations	1.5
2.	Basic Defensive Operations	1.5
3.	Weapons Effect	0.5
4.	Terrain Walk (Analysis of City)	3.0
5.	Rappelling and Grappling Hooks	1.0
6.	Obstacle Course	0.5
7.	Selection and Preparation of Firing Positions	1.0
8.	Entry and Clearing a Building	1.0
9.	Using Demolitions to Construct a "Mousehole"	0.5
10.	Construction of Obstacles and Barriers	0.5
11.	Individual and Fire Team Movement Techniques	1.0
12.	Mines and Molotov Cocktails	0.5
13.	Squad Movement Techniques	2.0
14.	Squad Entry & Clearing Techniques (Day & Night)	4.5
15.	Squad Defensive Techniques	5.5
16.	Platoon Attack/Defense, Day	8.0
17.	Platoon Attack/Defense, Night	6.0
18.	Company/Team Attack/Defense, Day	8.0
19.	Company/Team Attack/Defense, Night	6.0
		52.5

RECAPITULATION OF POI

Day Training 35.5 hours

Night Training 17.0 hours

In addition to the preceeding excerpt, Training for the Urban Battle (1978) presents a detailed description of each of the selected training tasks, and gives complete instructions to successfully conduct MOUT training. The Berlin Brigade has also developed a "Job Book" for MOUT individual skills to supplement their ARTEP training. An extract from this "Job Book" is reprinted below:

BERLIN MOUT SUPPLEMENT TO TC 711B/C/H (JB)

REFERENCE MOUT ARTEP
INDIVIDUAL MOUT SKILLS

MOVEMENT

TASK NO.	DESCRIPTION	GO	NO GO	DATE
1-1	Move across a street			
1-2	Move parallel to a building			
1-3	Move across rooftops			
1-4	Cross obstacles (wall and fences)			
1-5	Move between floors w/stairs			
1-6	Move between floors w/o stairs			
1-7	Move through hallway			
1-8	Move through sewers and subways			

ENTER/EXIT STRUCTURES OR ROOMS

TASK NO.	DESCRIPTION	GO	NO GO	DATE
2-1	Detect booby traps			
2-2	Enter building/room through a doorway			
2-3	Enter building/room through a window			
2-4	Enter building/room through a mousehole			
2-5	Exit a structure by rappeling			
2-6	Enter a structure utilizing a grappling hook			

COMBAT TECHNIQUES

TASK NO.	DESCRIPTION	GO	NO GO	DATE
3-1	Fire through windows, loopholes, or doorways			
3-2	Fire a LAW, M202, 90mm recoilless rifle inside a building			
3-3	Fire a Dragon inside a building (11B only)			
3-4	Fire around a corner			
3-5	Observe around a corner			
3-6	Mark a cleared room			
3-7	Prepare a defensive position for an M16 or M203			
3-8	Prepare a defensive position for an M60 or .50 caliber M2 (11B)			
3-9	Prepare a defensive position for a LAW, M202, 90mm recoilless rifle, or Dragon			
3-10	Blow a mousehole with C4/TNT			
3-11	Throw a hand grenade			
3-12	Use hand and arm signals			

Doughboy City consists of 19 buildings, constructed in the mid-1970s. A map of the facility is shown in Figure 5. There is an ongoing construction project to add 19 buildings, a railroad track, and a sewer system. This addition to the facility will be located due east of the present facility and is scheduled for completion in 1984. All of the older buildings are slab concrete with no cellars, while some of the new buildings will have both pitched roofs and cellars. All of the buildings, both old and new, have at least two stories. The tallest building is five stories high. The major disadvantage of Doughboy City is that it looks exactly like a military training area. There are no trees, shrubs, fences, garages, window shutters, or any of the other myriad of forms found in an urban environment. Each of these items are more than ornamental; they provide the cover and concealment necessary in MOUT. These items also add realism that is missing from too many training areas.

A MOUT obstacle course has been constructed by the Berlin Brigade adjacent to Doughboy City. This course consists of 12 separate obstacles that are to be negotiated by a fire team. The course is used as a concurrent training station within their MOUT POI. Developed by the Berlin Brigade in 1981, a lesson plan for use of the MOUT obstacle course is reprinted on the following pages.

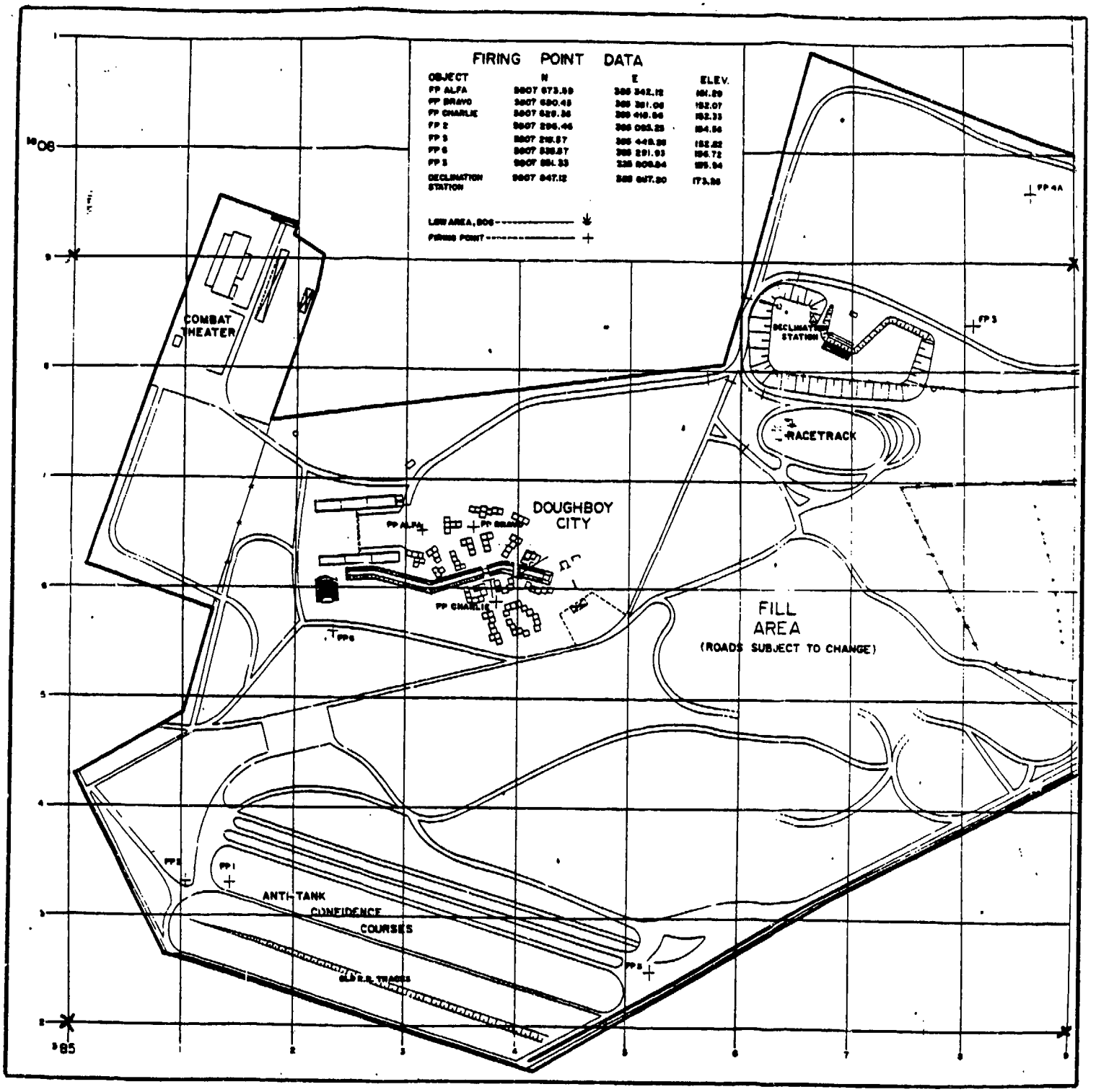

Figure 5. Doughboy City Training Facility for MOUT
US Sector, Berlin

LESSON PLAN FOR MOUT OBSTACLE COURSE TRAINING

1. TRAINING OBJECTIVE
   TASK: MOUT Obstacle Course
   CONDITION: Given an infantry squad in seasonal alert uniform at the MOUT obstacle course at Parks Range
   STANDARD: Each fire team will:
   (a) Start each obstacle as a team.
   (b) Complete each of the 12 obstacles as outlined in ITO #1-12.
   (c) Complete the course in 15 minutes.

2. ITO #1
   TASK: 9-Foot Wall
   CONDITION: Same
   STANDARD: Each fire team will:
   (a) Boost first man to the top of the wall.
   (b) The top man will pull second man up.
   (c) After the first man goes down the far side second man will pull up the third man.
   (d) Continue in the same manner until the entire team has crossed obstacle.

3. ITO #2
   TASK: Sewer Pipe Walk
   CONDITION: Same
   STANDARD: Each member of the fire team will go through the large and small pipes.

4. ITO #3
   TASK: Rafter Walk
   CONDITION: Same
   STANDARD: Each member of the fire team will:
   (a) Use the rope to climb the wall.
   (b) Step up to, and walk across the first beam.
   (c) Step down to, and walk across the second beam.
   (d) Walk down the ramp.

5. ITO #4.
   TASK: Rafter Walk
   CONDITION: Same
   STANDARD: Each member of the fire team will:
   (a) Climb into a window.
   (b) Go hand over hand across the metal bar.
   (c) Jump out of the window on the other side.

6. ITO #5.
   TASK: Hip-Hip
   CONDITION: Same
   STANDARD: Each member of the fire team will cross all of the horizontal beams in one lane while holding his weapon at a high port.

7. ITO #6.
   TASK: Barrel Maze
   CONDITION: Same
   STANDARD: Each member of the fire team will:
   (a) Enter either the left or right door.
   (b) Have the door closed behind him.
   (c) Have the door on the far end opened when he knocks on it.

8. ITO #7.
   TASK: Wall Rope Climb
   CONDITION Same
   STANDARD: Each member of the fire team will:
   (a) Climb to the top platform using the rope.
   (b) Climb down the rope on the other side.
   (c) Team members may help each other.

9. ITO #8.
   TASK: Roof Walk
   CONDITION: Same
   STANDARD: Each member of the fire team will:
   (a) Climb the pole using the attached spikes.
   (b) Cross the peaked roof.
   (c) Lean out and grab the galvanized pole.
   (d) Slide down the galvanized pole.

10. ITO #9.
   TASK: Rope Swing
   CONDITION Same
   STANDARD: Each member of the fire team will:
   (a) Grab the rope.
   (b) Swing across the ditch.
   (c) Place feet on top of the wall without touching the ground.

11. ITO #10.
   TASK: Platform Jump
   CONDITION: Same
   STANDARD Each member of the fire team will:
   (a) Run up the ramp.
   (b) Jump off the far end.
   (c) Execute a Parachute Landing Fall (PLF) in the gravel.

12. ITO "11.
   TASK: Low Crawl Pit
   CONDITION: Same
   STANDARD: Each member of the fire team will low crawl the length of one of the lanes.

13. ITO #12:
   TASK: Ledge Walk
   CONDITION: Same
   STANDARD: Each member of the fire team will:
   (a) Climb the pole with the spikes provided.
   (b) Cross the first ledge with his face to the wall.
   (c) Enter and crawl through the box.
   (d) Exit the box and cross the second ledge with his face to the wall.
   (e) Climb down the pole with the spikes provided.

14. ADMINISTRATIVE DATA.

(a) Personnel to be trained: Infantry squad.
(b) Training location: MOUT Obstacle Course, Parks Range.
(c) Time training is to be conducted:
(d) Principle Trainer: Officer or Senior NCO
(e) References: FM 90-10 and FM 21-20
(f) Training aids: None

15. SEQUENCE OF EVENTS

	ESTIMATED TIME
(a) Introduce Training Objective. Explain that operations on urbanized terrain require a greater variety of movement skills and more confidence in individual capabilities.	3 min.
(b) Explain how members of the squad are to cross each of the obstacles. Emphasis that this is a timed course and that the time is for a fire team to complete each obstacle so that team work is very important.	10 min.
(c) Answer any questions about obstacles.	2 min.
(d) First fire team goes through obstacle course.	15 min.
(e) Second fire team goes through obstacle course.	15 min.
(f) Critique obstacle course.	5 min.
TOTAL	50 min.

(g) NOTE: Second fire team starts 5 minutes after the first fire team.

16. ADDITIONAL COMMENTS AND INFORMATION.

(a) An aid man with litter is required to be on station during this training. If there is an FLA on the Parks Range Complex then another one is not required.

(b) This course is designed to handle one 10-man infantry squad at a time. If more people are on hand they should be rotated to this course as a station in a round-robin type situation.

(c) Weapons will be carried at port arms between each station and across all portions of all obstacles where the use of hands is not specifically required.

While observing soldiers negotiating the MOUT obstacle course, the need for some type of "rope climbing" training was again made evident. Most soldiers experienced great difficulty in climbing the ropes. While the absolute training value of a MOUT obstacle/confidence course is not known, the idea of such a course is excellent. When designing a MOUT course, every effort should be made to present realistic problems/obstacles. While having obstacle courses in MOUT training is highly appropriate, incorporation of obstacles within existing buildings is probably preferable to the construction of a separate obstacle course facility. For example, a MOUT confidence course with obstacles incorporated into existing buildings has been created at Bonnland, in the Hammelburg Training Area (see Appendix E).

While in Berlin, a cohort company was observed participating in the visiting unit training program at Doughboy City (USCOB/USAB Pamphlet 350-1, Berlin Brigade Visiting Unit Program of Instruction, 15 March 1982). The company observed was from a REFORGER unit that had been deployed to USAREUR from CONUS. The visiting unit program outlines five days of MOUT training during the six or seven days typically spent by a visiting unit in Berlin. In actuality, the total MOUT training time is about 24 hours. During this 24-hour program, instruction is provided in the following areas:

I. MOUT Offense

   A. favorable and unfavorable aspects of MOUT terrain features for the attacker

   B. the three phases of the MOUT attack

II. MOUT Defense

III. Urban Terrain Analysis

   A. identify construction type
   B. identify variations of mass construction
   C. identify variations of framed construction
   D. identify types of residential construction
   E. identify probable floor plans

IV. Individual and Team Round Robin

   A. individual movement techniques
   B. clearing techniques
   C. obstacle course
   D. defensive positions
   E. hasty firing positions
   F. construct defensive positions
   G. flame warfare
   H. barrier techniques
   I. booby traps

V. MOUT Te[illegible]n Walk

A. hi[illegible]-rise apartments
B. urban choke points
C. mechanical ambush site
D. water obstacle
E. overhead cover
F. underground passageways

VI. Squad Round Robin

A. combined arms teams in MOUT

1. commun[illegible] with tank

a. external telephone
b. hand and arm signals

2. travel while mounted on tank

a. mount a tank
b. ride a tank
c. react to contact

3. select, improve, and secure a tank defensive position
4. provide security in traveling formation
5. provide security in traveling overwatch
6. provide security in bounding overwatch

B. clear an urban area

1. conduct reconnaissance
2. plan operation
3. rehearse key actions
4. begin operation at designated time
5. use proper movement techniques
6. enter the objective building and use proper techniques to clear building
7. set up hasty defense

C. defend an urban area

1. recon
2. develop plan around crew served weapons
3. place security
4. construct defensive positions, priority to crew served weapons
5. construct barriers
6. withdraw to alternate positions
7. withdraw from positions

VII. Mortars in MOUT

A. select firing position
B. lay section with M2 aiming circle
C. improve position
D. select method of engagement
E. provide D/S to platoon in defense
F. use hide position

VIII. Clear an Urban Area

IX. Defend an Urban Area

Although this training is comprehensive, it is unlikely that the large number of tasks involved can be thoroughly learned in 24 hours of training. The training presented by Berlin Brigade personnel is professional. Instructors know their subjects and have excellent military bearing. The only shortcoming with the training is that insufficient time is allotted for practical exercise. Instructors provided 45 minutes of training at each of nine stations devoted to individual and team MOUT skills. Each squad received a presentation from the instructor at each station and then attempted to perform the task. This is a standard instructional approach, but the time allotted for practice is inadequate. For example, a fire team must meet eleven specific standards after receiving 9 minutes of instruction/demonstration and 14 minutes of practical exercise on clearing techniques. Further, soldiers were not required to repeat tasks that were performed incorrectly.

The week-long observation of a U.S. Army unit training in Berlin led the observers to the following conclusions:

1. More emphasis on MOUT training is needed in units other than infantry.

2. Although the current training program for visiting units is comprehensive, it cannot be accomplished in the time allotted.

3. Doughboy City could be a more realistic training area.

4. The MOUT obstacle course might have been more realistic if it had been incorporated into existing buildings.

While in Berlin, the observers also discussed MOUT training with British Army personnel and visited their training facility. The British MOUT facility in Berlin is called Ruhleben, a map of which was presented in Figure 3. It, like its American counterpart, is undergoing extensive expansion and renovation. Although the original facility consisted of eight buildings, 15 buildings were added and five more buildings are currently under construction.

In the opinion of the observers, Ruhleben is superior to Doughboy City in several ways. Great care went into the location of each building, the placement of entrances and exits, and the provision for realistic fields of fire.

Realism is further heightened by the addition of trees, shrubs, fences, and window shutters. Because of these factors, one receives the impression of being in a much larger town than is actually there. An ingenious facade, 10 meters high by 40 meters long, is being erected at the edge of the training area. It will depict a continuation of the city. Further, the use of elevated railroad tracks, bridges, and tunnels within Ruhleben has added a dimension to MOUT training that is not evident in the U.S. facility.

Ruhleben is normally used 365 days a year, according to the officers in charge. Every British battalion stationed in Berlin spends six weeks per year in the facility. This includes both night and day training. Skills taught range from individual tasks to company tactics and armored vehicles are used in company and platoon exercises. Additionally, the facility is used for:

1. brigade/battalion CPXs,

2. brigade logistic outloading trials and exercises,

3. trialling new concepts and tactics,

4. MOUT study days for soldiers, and

5. training American and French Army units.

Realism is being enhanced further by the addition of small arms simulators that will simulate the sound of two defending platoons. These simulators can be controlled remotely and will allow a small defending force to appear much larger.

The British Army also is concerned with weapons effects and the scale of maps used for MOUT. The British are planning to conduct a weapons effects study in the near future. In the case of maps, the British tentatively have adopted a 1:4000 black-and-white map for MOUT in Berlin. This map appears to be considerably better than a 1:50,000 map, and shows buildings, streets, alleys, and other relief items in much greater detail. The main disadvantage of a 1:4000 map is the size of the map needed for a specific mission.

An informal interview was conducted with the French Infantry Regimental Commander in Berlin, COL H. Paris. Although the French Army does not have its own MOUT facility in Berlin, it extensively uses both the U.S. and British facilities. Each French company spends four to six weeks per year in these facilities. The French Army also conducts extensive CPXs, both tactically and logistically. Every phase of a MOUT battle is gamed and practiced. COL Paris stated that French soldiers perform MOUT tasks which are identical to those of their U.S. and British counterparts. He also said the smaller, more manueverable French tank (AMX) is better suited for MOUT than the M60 or Chieftan. This statement was supported by British and U.S. input. According to COL Paris, the key to a MOUT battle is the discipline and training of the soldier, coupled with the professionalism and dedication of their leaders. He concluded that the French Army has all of the attributes needed to be successful in MOUT.

APPENDIX E

HAMMELBURG TRAINING AREA, FEDERAL REPUBLIC OF GERMANY

Overview of Training Facilities

Located near the town of Hammelburg is the Hammelburg Training Area, one of the major training centers of the West German Army. First used in 1896, the Hammelburg Training Area is equipped with firing ranges for small arms, hand held anti-tank weapons, mortars, and anti-tank guided missles. In addition, the training area includes two former villages, Bonnland and Hundsfeld, which are now used exclusively for MOUT training.

Currently, three major organizations are located at the Hammelburg Training Area. First, the German Infantry School (Combat Arms School I) was established and located there in 1956. Second, the Infantry Demonstration Battalion 351 was organized shortly afterwards to support the expanding training activities of the Infantry School. Third, various units of Panzer-grenadier Brigade 35 have been stationed at Hammelburg since 1960.

The Hammelburg Training Area serves a twofold purpose. First, it provides training and billeting facilities to visiting German and allied infantry units. Second, an extensive instructor training progam for the German Infantry is conducted by Infantry School personnel. Unlike the philosophy and organization of training in the U.S. Army, West German soldiers receive advanced training in infantry skills primarily within their own battalions. Personnel from each German Infantry battalion attend specialized courses at the Infantry School, where they are taught prescribed infantry training techniques through a combination of classroom and performance-oriented instruction. Upon returning to their respective battalions, these newly-trained instructors assume responsibility for the planning and conduct of training in their own units. Thus, every German Infantry battalion has its own MOUT training experts, small arms training experts, etc.

Bonnland. Of the two actual villages used for MOUT training in the Hammelburg Training Area, Bonnland is the larger. Approximately 50 separate buildings or structures can be used for training in Bonnland, a map of which was shown in Figure 2. The primary advantage of Bonnland is that it provides a realistic atmosphere for the conduct of MOUT training. With the exception of the absence of an indigenous civilian population, Bonnland is typical of many small villages found in Europe, particularly in West Germany. Contributing features to the training realism are multi-story buildings with basements, narrow streets through which tracked vehicles can be maneuvered, trees and foliage, a stream, a church, and even a castle. The majority of Bonnland's buildings are of brick or half-timber construction, and most have ceramic tile roofs. An administrative and maintenance staff, coupled with the requirement that visiting units provide maintenance/engineering support personnel, ensures the continual upkeep of these facilities. Greifenstein castle, which is a historical monument, and Bonnland's church, in which services are still conducted, are off-limits for training exercises. However, an elaborate display of urban fighting positions has been constructed in one area of Greifenstein castle, through which visiting units are routinely given an instructional tour.

A recent addition to Bonnland is the design and construction of a MOUT confidence course, which runs through a number of existing buildings in the village. Designed by LTC Peter A. Igel, TRADOC Liaison Officer to the German Infantry School, the MOUT confidence course is organized around a series of 15 obstacles:

1. rope ladder,	6. slide,	11. rope descend,
2. beam walk,	7. roof walk,	12. ledge walk,
3. overhead crossing,	8. rope climb,	13. wall climb,
4. obstacle corridor,	9. rafter crossing,	14. duct descend, and
5. trench,	10. rope swing,	15. maze.

The stated purpose of the course is "to introduce the soldier to some of the movement skills required for urban combat and to enhance confidence in individual capabilities during the execution of these skills." The course is intended to be a timed exercise and to be negotiated by either a fire team or squad. Emphasis is placed on the effective use of teamwork to overcome each obstacle.

Two primary advantages in the design and utilization of Bonnland's MOUT confidence course are evident. First, the course possesses inherent realism. Because course obstacles are integrated within actual urban buildings, the need to achieve competency in the movement techniques of MOUT is better illustrated to the soldier. Second, the course is designed to utilize both team and individual skills, unlike most obstacle courses which emphasize only individual skills.

Hundsfeld. Hundsfeld is a former hamlet, consisting of about 10 separate buildings, that is also used for certain aspects of MOUT training. Primarily, Hundsfeld is utilized in lieu of Bonnland whenever a live fire capability is required for training. Because Hundsfeld is located at the edge of a range and impact area, soldiers can fire at a variety of personnel and vehicular pop-up targets from positions inside and around many of the buildings. Rifles, machineguns, and hand held anti-tank weapons can be used within the respective range boundaries established for these weapons. In addition, pop-up targets have been placed in the windows of two buildings. These targets may be engaged with plastic ammunition from a restricted number of firing positions. A map of Hundsfeld is presented, with superimposed firing fans for live fire target engagement, in Figure 6.

Use of MOUT Training Facilities

West German Infantry battalions typically conduct MOUT training at Bonnland once every 18 months, usually for a period of two weeks. A "forest fighting" training program, conducted in a wooded area adjacent to Bonnland, is included in this time schedule. Additionally, the facilities are utilized by approximately six U.S. Infantry battalions annually. Both a U.S. Infantry battalion and elements of a German Infantry battalion were observed conducting MOUT training in Bonnland during October of 1982. Because these units appeared to be representative of the infantry units in their respective forces, a

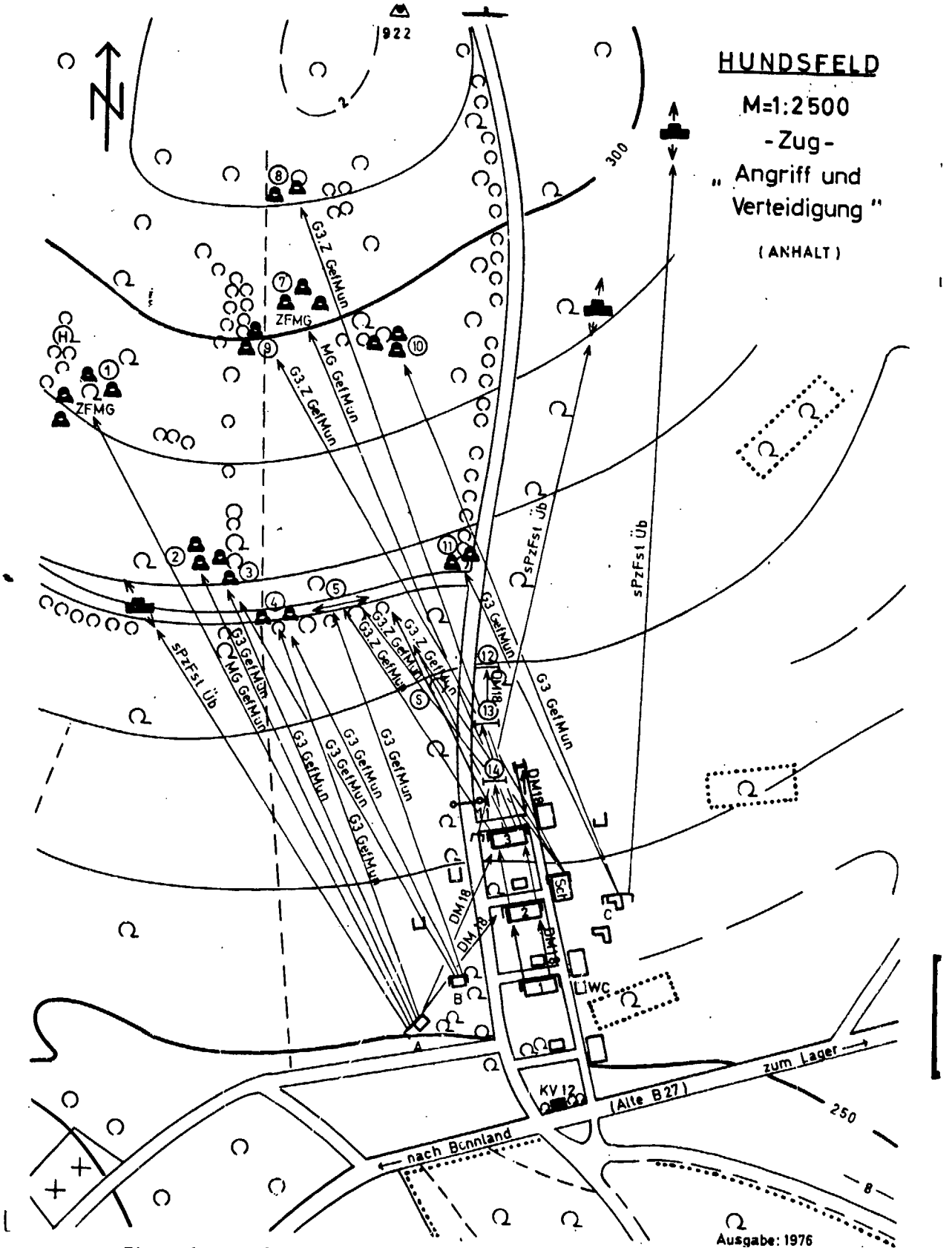

Figure 6. Hundsfeld Training Site
Hammelburg, Federal Republic of Germany

comparison of their MOUT training procedures was made. Methodological differences in MOUT training between West German and U.S. Infantry units visiting Bonnland were identified. Due to the fact that observation was limited to one West German unit and one American unit, a series of interviews was conducted with German Infantry School officials who have routinely observed the Bonnland training of both U.S. and West German forces during recent years. Information obtained through these interviews was used to establish the representativeness of the observational data. Unless otherwise noted, no data are reported herein which appear to be uncharacteristic of the majority of either U.S. or West German Infantry units.

MOUT Training Conducted by West German Infantry Units. West German Infantry units training at Bonnland generally follow a standardized MOUT POI developed by their Infantry School. Appendix F contains an outline of the German Infantry School MOUT POI. This POI is organized around the following nine stations, each devoted to a different MOUT training subject:

1. approach and enter a building in an upper floor,
2. fighting from room to room with doors open, closed, or barricaded,
3. fighting from floor to floor,
4. breach wire obstacles,
5. construction of fighting positions and obstacles inside a building,
6. build obstacles outside buildings,
7. prepare for defense from positions inside a building,
8. defend positions inside a building against penetrated enemy soldiers, and
9. advance along streets.

Each station, with the exception of the ninth, is composed of a different group of buildings in Bonnland. Platoons are rotated through stations, each squad being assigned to one building in each station. With squad leaders having primary responsibility for the training of their own respective squads, approximately 90 minutes are spent at each of the nine stations. Training at the ninth station, "Advance along streets," is conducted at platoon level by squad and platoon leaders.

The West German organization of MOUT training requires that each squad and platoon leader be proficient in teaching each of the nine training subjects previously listed. To ensure the proficiency of squad and platoon leaders, an instructor training program is conducted in Bonnland prior to the arrival of the entire battalion. Lasting several days, instructor training is organized and supervised by Infantry School MOUT experts. Additionally, one platoon is typically detailed to train in Bonnland for a similar period of time before the remainder of the battalion arrives. The purpose of this advance training is to provide the battalion with a competent platoon demonstration of MOUT

tasks and skills. Several buildings in Bonnland have one wall cut away to permit observation of training/demonstration activities from the exterior.

Four general observations best characterize the MOUT training conducted by West German units in Bonnland. First, platoon leaders take an active part as trainers. Evidence of their MOUT expertise is demonstrated in their continual critique of the performance of their platoon members. Second, there is a high level of repetition in the performance of basic MOUT tasks. Tasks may be repeated upwards of a dozen times, until squad execution is virtually flawless. Attention to detail is great. Third, timely feedback is provided to soldiers on the quality of their performance. When errors are committed, an immediate critique is usually forthcoming from squad/platoon leaders. Conversely, outstanding performance is praised. Fourth, the predominant emphasis in MOUT training is on fundamental individual skills and their coordination at fire team and squad levels. After these skills are mastered, the coordination among squads within a platoon is stressed. Little emphasis is placed on company or battalion level exercises.

The philosophy expressed by West German officers is that squads and platoons will conduct MOUT operations. Company and higher command elements will coordinate and supply platoon activities. The nature of urban fighting involves isolated events which seldom encompass companies fighting on one street. A company might have two or three platoons fighting on parrallel streets with squads clearing houses one at a time.

Several additional points warrant notation. In particular, specialized MOUT equipment such as rope ladders and grappling hooks are standard issue in the West German Infantry and soldiers are trained to become proficient in their use. Further, the use of snipers in an urban environment has been given serious consideration. Although the assignment of snipers during an actual operation is voluntary, a formal sniper training program, including the selection and construction of sniper positions in a MOUT environment, is conducted by the German Infantry School. Finally, German Infantry units address a variety of logistical issues in their MOUT training, including the problems associated with ammunition resupply, the removal and treatment of casualties, and the establishment of secondary communication networks (e.g., wire and/or "runners").

MOUT Training Conducted by U.S. Infantry Units. U.S. Infantry units visiting Bonnland are given the opportunity of using the MOUT POI and instructor training program provided by the German Infantry School. Some units take full advantage of this opportunity, while others prefer to use their own training format exclusively. However, most visiting U.S. battalions follow the West German POI at least partially.

Based upon the observation of and discussion with personnel of one representative U.S. Infantry battalion, three major trends emerged which appear to be characteristic of visiting U.S. units in general. First, many U.S. units do not appear to be prepared to fully exploit the training advantage which Bonnland affords them. One reason for this is the lack of specialized MOUT equipment used to gain entry into buildings. Because items such as grappling hooks and rope ladders are not standard issue in the U.S.

Army, soldiers have not had the opportunity to become familiarized with their use. It was learned that some visiting U.S. units have given relatively expensive items such as tents and sleeping bags to the Germans in exchange for inexpensive rope ladders and grappling hooks. Second, there exists a tendency among U.S. units to conduct grand combat scenarios in Bonnland, at the expense of mastering basic MOUT fundamentals. While soldiers are exposed to most of the important individual skills, these tasks are not rehearsed or repeated to the point that proficiency is attained. In effect, company and battalion exercises are conducted prior to achieving effective coordination at lower echelons. Such exercises tend to be unproductive because errors in technique are commonplace, while the opportunity to give instructional feedback to soldiers during the course of an exercise is limited. Third, platoon leaders are largely removed from the actual conduct of training, leaving the bulk of the instructional responsibility to their NCOs. The relative lack of command presence can be a detractor to effective training. Unfortunately, platoon leaders and company commanders are often sidetracked by administrative details, handling unforeseen problems, planning the conduct of later training, etc.

The lack of emphasis on the mastery of basic skills was demonstrated by comparison between U.S. and West German three-man elements gaining house entry through a window requiring rope and hook assistance. The West German unit performed this exercise fluidly, without a loss in the tempo of the building assault. The first soldier up the rope was skilled and practiced at throwing a grenade in the window and following immediately after the blast with rifle fire accompanying his entry. The U.S. soldiers, however, had not had sufficient practice to make this a coordinated act on. The first soldier in was still unfamiliar with rope climbing techniques. He had difficulty coordinating a grenade toss with maintenance of his position on the rope. Rifle fire was an afterthought on entry. Specialized quick-release weapons slings, used by the West Germans and unavailable to U.S. soldiers, might have helped.

Visiting U.S. units invariably find training in Bonnland to be an interesting and challenging experience. The morale of soldiers is usually high. Offering potential enhancement to MOUT training in Bonnland is the utilization of MILES equipment. Most U.S. battalions which have integrated MILES into their Bonnland training have found it to be beneficial, despite the added requirements imposed by weapons zeroing and equipment maintenance. The performance of soldiers generally improves when MILES equipment is used, simply because a soldier's probability of survival is greater when correct MOUT techniques are practiced.

Summary. A comparison of the training conducted by West German and U.S. Infantry units in Bonnland identified a number of important differences in their respective MOUT training programs. Major differences include the following:

1. West German MOUT training emphasizes individual skills and team/squad coordination. U.S. training rapidly progresses to the conduct of company and battalion exercises, before the tasks at lower echelons are completely mastered.

2. Unlike U.S. units, West German units have specialized items of MOUT equipment (e.g., grappling hooks and rope ladders) and their personnel are trained to become proficient in their use.

3. West German platoon leaders take a more active role in the actual conduct of training than do their U.S. counterparts.

4. There is more repetition and detailed performance feedback provided to soldiers in West German units than in U.S. units.

APPENDIX F

GERMAN INFANTRY SCHOOL MOUT POI

Combat Arms School 1
School Staff Org Off
City/Forest Fighting

Hammelburg, May 1981

Training Field:	Military Operations on Urbanized Terrain (MOUT)
Training Subject:	Assualt a building
Section:	Approach and enter a building in an upper floor
Training Objectives:	The soldier should be able to enter an upper floor with the help of - a rope ladder - a rope with grappling hook - a rope with bar - a pole and learn the teamwork within the fire team when entering a building in practical training
Training Form/Procedure:	Practical duty/station training
Regulations	ZDv 3/11, No 2143-2148, (FM 90-10, Appendix G, ST 90-10, Annex D)
Time:	90 minutes
Location:	BONNLAND, Houses 6, 8, 10, 12 (STATION 1)
Personnel:	1 squad per house
Responsibility:	Squad leader
Materials:	1 rope ladder 1 rope with grappling hook 1 rope with bar 1 pole (ca. 5 meters long, 10 cm diameter) 5 hand grenades 10 chest harnesses 2 safety ropes 100 rounds blank ammunition (rifle) (per house)

Conduct of the Training

TIME	ACTION	REMARKS
0-1	The chief instructor (CI) explains the - subject and the section of the training - training objective	
1-4	The CI explains while the assistant instructor (AI) demonstrates how - to throw a rope with grappling hook into an upper floor window - to climb up and enter	- hug the wall closely - hold the grappling by the eye - take one step forward to gain momentum - throw in a hand grenade just prior to entering
4-7	The CI explains, the AI demonstrates how - to put the rope ladder together - to hook it to a window in the upper floor - to enter the building with a rope ladder	
7-30	The soldiers alternately a) - throw the rope with grappling hook - enter the building under the supervision of the CI b) - put the rope ladder together - hook it to a window - climb up and enter under the supervision of the AI	- the soldiers must be secured (ZDv 3/11, No 751, HDv 347/1 No 97, 100, 118) - two soldiers work together in assembling the rope ladder - safety man checks if hook is firmly seated before a soldier climbs up
30-33	The CI explains while the AI demonstrates - how to throw a rope with bar	
33-36	The CI explains while the AI demonstrates - how to to enter an upper floor with the help of a pole	
36-60	The soldiers alternately a) enter an upper floor with the help of a pole under the supervison of the CI b) throw the rope with bar under the supervision of the AI	
60-90	Approach and enter a house The CI describes the scenario: "Our platoon is attacking this group of houses (point it out). Four enemy riflemen have been identified in this house (point it out). The second team has moved into position in this house to overwatch the movements of the first team until the first team has come this far (point it out) and will suppress the enemy in (point it out) when the platoon leader whistles.	

TIME	ACTION	REMARKS
60-90	Approach and enter a house (continued) First team has reached this corner (point it out). First team has the mission to assault and enter the house through this window (point it out) with a rope and a grappling hook with fire support from the second team when the platoon leader whistles. The leader of the first team has just given the following order: "When the second team starts firing, we will rush to the house in front of us, rifleman (rflmn) 1 will go there, rflmn 2 over there and I'll go there (point it out). Immediately after that, you, rflmn 1, will throw the grappling hook through this window and enter after lobbing in a grenade. I'll come up next and rflmn 2 will follow. Get ready!" The CI has them assume the starting positions and orders them to start the exercise - whistles. The CI allows the exercise to run to completion and critiques afterwards.	The critique should be kept to a minimum so that the exercise can be repeated with the soldiers in different roles.

Combat Arms School 1
School Staff Org Off
City/Forest Fighting

Hammelburg, May 1981

Training Field:	Military Operations on Urbanized Terrain (MOUT)
Training Subject:	Fighting inside a building
Section:	Fighting from room to room with doors open, closed or baricaded
Training Objectives:	The soldier should be able to - shoot and blast a door open - perform the actions of the individual soldier within a fire team when clearing a room - react correctly when enemy hand grenades are thrown or when friendly grenades roll back
Training Form/Procedure:	Practical duty/station training
Regulations:	ZDv 3/11, No 2149-2155, (FM 90-10, Appendix G, ST 90-10, Annex D)
Time:	90 minutes
Location:	BONNLAND, Houses 23, 25, 27, 31 (STATION 2)
Personnel:	1 squad per house
Responsibility:	Squad leader
Materials:	10 HE hand grenades (practice) 5 wooden blocks as dummy hand grenades 2 satchel charges (inert) 200 rounds blank ammo (rifle) (per house)

Conduct of the Training

TIME	ACTION	REMARKS
0-1	The Chief Instructor (CI) explains - the training subject, section - the training objective	
1-4	Clear an adjacent room through an open door The CI describes the scenario: "After entering the house, the team leader is located there, rflmn 1 there, and rflmn 2 there (point it out). Therefore the team leader has just ordered the follo ng: "You, rflmn 1, take your position on the right of the door, I'll be on the left of the door, and you, rflmn 2 will overwatch the door from the depth of the room over there (point it out). When I give you the signal, you, rflmn 1, will lob a grenade into the room, then I'll rush in, spraying the room with automatic fire, and then both of you, first rflmn 1, then rflmn 2, will follow without firing. Get ready!"	
4-5	The CI has them assume the initial situation.	CI = team leader AI = rflmn 1 1 soldier = rflmn 2
5-6	The team clears the adjacent room.	The team leader moves to the left of the door after rushing in and directs the soldiers following him.
6-62	The CI details 3 soldiers as fire team and has them repeat how adjacent rooms are cleared while the rest is watching. The scenario will be repeated nine times until every soldier has done every job in the team.	Keep the critique to a minimum.
62-63	Shoot a locked door open The CI explains, the AI demonstrates.	Shoot at the lock obliquely (automatic fire)
63-70	The soldiers perform the task at two doors under the supervision of the CI and the AI.	The doors must not be damaged.
70-72	Blast a barricaded door open The CI explains, the AI demonstrates.	Take cover after emplacing the satchel charge. The AI will open the door upon "detonation" to simulate the "blast effects"

Conduct of the Training

T I M E	ACTION	REMARKS
72-80	The soldiers perform the tasks at two doors under the supervision of the CI and the AI.	The doors must not be damaged.
80-82	Reactions to hand grenades thrown by the enemy or to friendly grenades rolling back The CI explains, the AI demonstrates how to: a) throw or kick them back b) take cover (lie flat on the floor) and fire a burst in the direction where the grenade came from after the detonation.	
82-90	The soldiers repeat and practice the tasks under the supervision of the CI and the AI.	No aggressor detail will be used, the instructors throw the grenades.

Combat Arms School 1
School Staff Org Off
City/Forest Fighting

Hammelburg, May 1981

Training Field:	Military Operations on Urbanized Terrain (MOUT)
Training Subject:	Fighting inside a building
Section:	Fighting floor to floor
Training Objectives:	The soldier should be able to perform the actions of the individual rifleman within a fire team when - fighting on stairs - fighting through holes in the ceiling.
Training Form/Procedure:	Practical duty/station training
Regulations:	ZDv 3/11, No 2149-2155, 2157 (FM 90-10, Appendix G, ST 90-10, Annex D)
Time:	90 minutes
Location:	BONNLAND, Houses 15, 17, 19, 21 (STATION 3)
Personnel:	1 squad per house
Responsibility:	Squad leader
Materials:	20 hand grenades (practice) 200 rounds blank ammo (rifle) (per house)

Conduct of the Training

TIME	ACTION	REMARKS
0-1	The CI describes the - training subject, section - training objective	
1-4	Advance to an upper floor via a stairway which is not blocked The CI describes the scenario: "After taking the ground floor, the 1st fire team has to rush up these stairs and secure a foothold there so that the 2nd team can carry on with the attack past the 1st team to clear the upper floor." The leader of the 1st team then orders: "You, rflmn 1, take a position on the left of the stairs, I'll be on the right of them, you, rflmn 2, move to the wall (point it out) to overwatch the stairs. When I give you the signal, you, rflmn 1, will lob a grenade to the upper hallway. I'll rush up firing immediately after the explosion, and then you'll follow, first rflmn 1, then rflmn 2, both without firing. I'll take a position there to cover to the left, rflmn 1 cover to the right, and you, rflmn 2, will cover the stairs to the attic. Get ready!"	
4-5	The CI and the participants move to their starting positions.	CI = team leader AI = rifleman 1 1 soldier = rifleman 2
5-6	The fire team assaults up the stairs.	
6-45	The CI designates 3 soldiers to form a fire team and has them repeat the task while the rest are watching. The scenario will be repeated nine times until every soldier has performed every job.	Keep the critique to a minimum.
45-47	Advance to a lower-level room through a hole in the floor The CI describes the scenario: "After entering through a window and clearing the upper floor, the 1st fire team has been ordered to breach a hole through the floor and then to clear and hold the room below the hole. Before emplacing the charge, the team leader orders: "Immediately after the explosion, I'll jump down and spray the room with automatic fire, and then you, rflmn 1, and you, rflmn 2, will follow, both without firing. Get ready!"	The holes already available will be addressed and used as the ones to be blown.

Conduct of the Training

T I M E	ACTION	REMARKS
47-48	The CI has the participants assume their starting positions.	CI = team leader AI = rifleman 1 1 soldier = rifleman 2
48-50	The fire team takes the lower room.	- drop a hand grenade down into the room - slide down quickly (spray the room in all directions before that) - quickly establish control of all accesses
50-90	The CI designates three men to form a team and has them take the lower room. The scenario will be repeated nine times until every soldier has performed every job in the team.	- soldiers not accustomed to this task should not be allowed to jump down in the beginning, danger of injury!

Combat Arms School 1
School Staff Org Off
City/Forest Fighting

Hammelburg, May 1981

Training Field:	Military Operations on Urbanized Terrain (MOUT)
Training Subject:	Negotiate obstacles
Section:	Breach wire obstacles
Training Objectives:	The soldier should be able to - breach a double-apron fence with explosives - cut a concertina wire obstacle - bridge a concertina wire obstacle and perform the actions required within a fire team
Training Form/Procedure:	Practical duty/station training
Regulations:	ZDv 3/701, No 1501-1511 No F 1.1.3.1/1 - 1.1.3.1/5
Time:	90 minutes The training is conducted on three sites (30 minutes each) in round robin fashion
Location:	BONNLAND 1 and 3 west of the buildings (STATION 4)
Personnel:	1 squad per site
Responsibility:	Squad leader
Materials:	Training Site 1 (demolitions) - 1 bangalore torpedo (inert) consisting of 4 sections with blasting cap igniters (inert) and fuze - 20 simulators DM 12 - 1 roll of white engineer tape - 1 machinegun with accessories - 1000 rounds blank ammunition 7.62 x 51 - 2 silhouette targets Training Site 2 (cutting) - 3 wire cutters or bolt cutters - 6 pairs of leather mittens with reinforced palm Training Site 3 (bridging) - 1 ladder - 1 board - 3 pairs of leather mittens with reinforced palm - 1 machinegun with accessories - 1000 rounds blank ammo 7.62 x 51 - 2 silhouette targets

Remark: The obstacles have to be erected (rebuilt) before the beginning of the training. The work detail of the battalion in Bonnland will provide support in erecting the obstacles and in preparing the materials.

Conduct of the Training

T I M E	ACTION	REMARKS
0-1	The Chief Instructor (CI) describes - the training subject - the training objective	
1-5	Station 1 - Breach a double-apron fence with explosives The CI describes the scenario: "Our squad is attacking in this direction within the platoon and has been ordered to take this house. So far, two enemy riflemen have been identified over there...and over there...(point it out). Presently, the squad is employed as follows: Covering team Team leader and machinegunner in position over there.... Mission: Suppress enemy in the building. Demolition team Riflemen 1 and 2 over there..., ready to blow up the double-apron fence when ordered by the squad leader. Maneuver team Squad leader, riflemen 3 and 4 there..., ready for assaulting. Initially they will advance up to that shack/lean-to and then continue toward the house." The CI has everybody assume their starting positions. The CI orders: "After the detonation, I'll rush through the breach first, then rflmn 3, then rflmn 4. Ready - fire. Demo team, go!"	Initially the CI performs the tasks of the squad leader. Initially the team should not advance any further than the shack, because further enemy soldiers will now appear, and therefore the fires have to be reorganized.
5-30	The CI discusses the mistakes made and has the scenario repeated until every soldier of the squad has been in the demo team once.	
1-5	Station 2 - Cut a concertina wire obstacle The CI explains: "Here on this station we do drill-type training on how to cut a gap into a concertina wire obstacle. We need 3 soldiers for this task. One man will cut (CI points out the location of the cuts), the others pull the cut wire to the sides and fasten it there. I will demonstrate it now." The CI demonstrates the procedure with the help of two soldiers.	The CI mentions the Booby-trap hazard!

Conduct of the Training

T I M E	ACTION	REMARKS
3-30	The CI splits up the squad into (3 man) teams and has them all practice the procedure simultaneously until every soldier has performed every task.	The CI installs some booby-traps before the beginning of the training.
1-5	Station 3 - Bridge a concertina wire obstacle The CI describes the scenario: "Our squad is attacking in this direction within the platoon and has been ordered to enter this barn/house initially. So far, we have identified a concertina wire obstacle over there...and one rflmn in the house/barn over there...Presently, the squad is employed as follows: Covering team Team leader and machinegunner in position there Mission: Suppress enemy in the barn/house. 1st maneuver team there...(point it out). Mission: Throw ladder (board) across the obstacle over there. I will lead the 2nd maneuver team and we will cross the obstacle over there and rush up to the barn there...1st team will follow upon my signal." The CI has the participants assume their starting positions. The CI orders: "As soon as the ladder (board) is in place, I will rush across, then rflmn 1, then rflmn 2. Fire only after crossing the obstacle. Ready - (covering team) fire! 1st maneuver team - go!"	Push the ladder (board) across the obstacle close to the wall/pickets.
5-30	The CI discusses the mistakes, has the men assume the starting position again and repeats the scenario until every soldier has been employed in each function.	

Combat Arms School 1
School Staff Org Off
City/Forest Fighting

Hammelburg, May 1981

Training Field:	Military Operations on Urbanized Terrain (MOUT)
Training Subject:	Defend a building
Section:	Construction of fighting positions and obstacles inside a building
Training Objectives:	The soldier should learn how to build positions and obstacles inside a building
Training Form/Procedure:	Practical duty/station training
Regulations:	ZDv 3/11, No 2118-2135, ZDv 3/706 Chapter 5 (FM 90-10, Appendix C, ST 90-10, Annex A, C, E)
Time:	90 minutes
Location:	BONNLAND, Houses 1, 2, 3 and 5 (STATION 5)
Personnel:	1 squad per site
Responsibility:	Squad leader
Materials:	Construction materials for positions inside the buildings, in addition to that: - tools - chicken wire - nails, clamps - wire

Conduct of the Training

TIME	ACTION	REMARKS
0-1	The Chief Instructor (CI) describes - the training subject, section - the training objective	
1-14	The CI describes the scenario: "Our squad will defend this house against enemy forces attacking from this direction (point it out). We will prepare: - 1 machinegun position there... - 1 rifleman's position there... - 1 sniper position there... Stairs and doors will be barricaded, the windows will be screened with chicken wire." The CI splits up the squad into teams and gives them the drawings or photocopies for the respective positions.	The squad is still outside the house.
14-75	The CI goes into the house and assigns missions. "Machinegunner position over there, mission...., left and right limits of your field of fire...., repeat mission, start working." Teams of two soldiers each receive their mission this way and start the construction of their positions immediately. A drawing or a photograph of the complete position is pinned up near every position as a construction guideline.	
75-90	The CI assembles the squad outside the house. The CI leads the squad from position to position and discusses the outcome. Finally, he collects the drawings and photographs he has handed out and has the positions removed again.	

Combat Arms School 1
School Staff Org Off
City/Forest Fighting

Hammelburg, May 1981

Training Field:	Military Operations on Urbanized Terrain (MOUT)
Training Subject:	Defend a building
Section:	Build obstacles outside buildings
Training Objectives:	The soldier should realize that there are dead spaces when defending from positions inside a building and learn to block these with obstacles. Beyond that, he should learn how to lay a hasty protective minefield.
Training Form/Procedure:	Practical duty/station training
Regulations:	ZDv 3/701, No 801-816, ZDv 3/760, No 543, Figure 516 (FM 90-10, Appendix D, ST 90-10, Annex C, E)
Time:	90 minutes
Location:	BONNLAND, Houses 7, 9, 11, 13 (STATION 6)
Personnel:	1 squad per house
Responsibility:	Squad leader
Materials:	Concertina wire engineer tape, white and yellow 10 pairs of leather mittens with reinforced palm 50 antitank mines (inert)

Conduct of the Training

T I M E	ACTION	REMARKS
0-1	The Chief Instructor (CI) describes - the training subject, section - the training objective	
1-2	The CI describes the scenario: "Our squad defends this house. After completing the construction of the fighting positions, the squad has been ordered to block the dead space around the house and to prepare a hasty protective minefield."	
2-60	The CI splits up the squad into 3-man teams and has them mark the - fields of fire (yellow engineer tape) - dead space (white engineer tape) for several positions.	1 soldier in the position 2 soldiers string out the engineer tape
60-90	The CI describes the various possibilities of blocking the dead spaces and has them carried out. Simultaneously, 1 team will prepare a hasty protective minefield. Afterwards this team will explain how this obstacle works - mines not too closely spaced (6 paces)[1] - camouflage the prepared minefield on the enemy's side. The CI has the tape and the obstacles removed.	

[1]One pace is approximately 0.75 meters.

Combat Arms School 1
School Staff Org Off
City/Forest Fighting

Hammelburg, May 1981

Training Field:	Military Operations on Urbanized Terrain (MOUT)
Training Subject:	Defend a building
Section:	Prepare for defense from positions inside a building
Training Objectives:	The soldier should - prepare primary/alternate/supplementary positions as ordered - be able to occupy these rapidly when ordered - reconnoiter and prepare counterattacks with his fire team against enemy soldiers who have entered the house. so that he is familiar with the house and able to cope with any imaginable turn of events.
Training Form/Procedure:	Practical duty/station training
Regulations:	ZDv 3/11, No 2136-2142, ZDv 3/760, No 524-533, 534, 535 (FM 90-10, Appendix C, ST 90-10, Annex A, C, E)
Time:	90 minutes
Location:	BONNLAND, Houses 33, 35, 37 and 43 (STATION 7)
Personnel:	1 squad per house
Responsibility:	Squad leader
Materials:	- - - - - -

Conduct of the Training

T I M E	ACTION	REMARKS
0-1	The Chief Instructor (CI) describes - the training subject, section - the training objective	
1-4	The CI describes the scenario: "Our platoon defends from positions in the center of the village against enemy forces attacking from this direction (south). The enemy, who is still approximately 30 kilometers away, is engaged by friendly covering forces. Our squad will defend this house (point it out)...squad is there,... squad there, platoon headquarters there (point it out). The mission of the squad is - to defend the positions so that enemy attacks from this direction (point it out) can be repulsed. - to provide flanking fire in front of the positions of...squad/platoon headquarters. The squad leader has reconnoitered the positions in the house, has announced the mission to his squad which has just arrived here, and starts assigning the individual tasks inside the house."	Outside the house
4-50	The CI goes into the house and orders (for example): "- Rflmn 1 and 2 take positions in the ground floor - Rflmn 3 and 4 positions in the upper floor - Rflmn 5 and 6 positions in the attic - my position.... dismissed, I'll come and see you in case you have any questions."	
	The CI assigns the tasks to the soldiers of the squad. Every rflmn is assigned one primary and one or more alternate/supplementary positions. The soldiers: - literally repeat their tasks - prepare their positions so that they can accomplish their mission without restrictions - assume firing positions to see if the fighting positions are suitable - practice moving to alternate/supplementary positions on various routes.	For command and control and fire distribution purposes, it is advisable to number the positions.

Conduct of the Training

T I M E	ACTION	REMARKS
50-60	The CI now has the men occupy their primary/ supplementary/alternate positions several times to check if the squad can still be led in combat. Example: CI: "Occupy machinegun position 2!" Machinegunner: "Position 2 occupied!"	The squad must be led silently or by shouting loudly, depending on the situation.
60-75	When every soldier is familiar with the routes and positions, the CI will train the men by issuing orders which are possible in combat, given the scenario and the mission. Example: CI: "Three enemy rflmn advancing on both sides of the street, probably elements of a dismounted reconnaissance patrol. Squad will destroy them by surprise fire! Therefore: Rflmn 2 occupy position 1 with a rifle, engage targets on the left side of the street! Machinegun position 13, overwatch street in depth, fire only when ordered! Rflmn 3 and 4 ...etc."	The CI checks the actions of the individuals/the teams according to the mission, makes corrections or has actions repeated if necessary.
75-85	Now the CI prepares counterattacks inside the house. This is done from the top to the bottom and the other way around as well, and also on the individual floors. Initially, the squad is "talked through" the counter-attack situations, then they practice the counterattacks in "slow motion", and finally at full speed when the men are familiar with their tasks.	The soldiers are familiarized with all squad positions, with the routes of communication inside the house, and realize that defense means being prepared for any imaginable situation and leaving nothing to chance.
85-90	Debriefing	

Combat Arms School 1
School Staff Org Off
City/Forest Fighting

Hammelburg, May 1981

Training Field:	Military Operations on Urbanized Terrain (MOUT)
Training Subject:	Defend a building
Section:	Defend positions inside a building against penetrated enemy soldiers
Training Objectives:	The soldier should learn how to defend his position against enemy soldiers, who have entered an adjacent room, how to gain fire superiority, and how to eliminate the penetrated enemy soldiers in a counterattack launched together with other team/squad members occupying adjacent positions. Beyond that, he should also learn how to contain an enemy attack launched from a higher or lower floor and how to launch counterattacks at the enemy with his fire team.
Training Form/Procedure:	Practical duty/station training
Regulations:	ZDv 3/11, No 2141-2142, (FM 90-10, Appendix G, ST 90-10, Annex D)
Time:	90 minutes
Location:	BONNLAND, Houses 42, 44, 46 and 48 (STATION 8)
Personnel:	1 squad per house
Responsibility:	Squad leader
Materials:	- bed spring frame, door, or closet, ammo boxes to barricade a door - 10 hand grenades (wooden blocks or practice, inert) - 200 rounds blank ammunition for rifle - 4 red armbands

Conduct of the Training

TIME	ACTION	REMARKS
0-1	The Chief Instructor (CI) describes - the training subject, section - the training objective	
1-3	The CI describes the scenario: "Our platoon defends from positions on both sides of HAUPTSTRASSE (Main Street). The enemy is attacking from the south and has occupied this house (point it out). The 1st squad will defend this house. Mission: - Prevent the enemy coming from this direction from advancing through the gardens along the creek - Provide flanking fire in front of 2nd squad located in this house (point it out). The squad is 'ready for action.'"	Squad standing in line outside the house.
3-26	The CI goes into the house now and continues with the scenario for the individual soldiers, for example: "Rflmn 1 and 2 - take your position there. Mission: Defend the area with left limit there...right limit there...." The enemy enters the house, takes an adjacent room and advances towards the position of Rflmn 1 and 2. The soldiers fire immediately, report (voice!) and prevent the enemy from entering their room. Watch out for hand grenades! The CI repeats the scenario with different soldiers until every soldier has been a defender at least once.	2 soldiers practice, 2 soldiers aggressors, the rest are watching.
26-47	Counterattack and eliminate enemy in adjacent room The CI describes the scenario: "Rflmn 1 and 2 holding this position here. Mission: The enemy got into that room a few seconds ago. The squad leader orders: Counterattack and eliminate the enemy!" The squad leader orders: "You Rflmn 1 stand on the right of the door, I'll be on the left of the door. Rflmn 2, you will overwatch the door from the depth of the room from there (point it out). When I give you the signal, you, rflmn 1, will throw a hand grenade into the room (blast the door open), then I'll rush into the room and spray it with automatic fire. Then you, rflmn 1, and then you, rflmn 2, will follow, both without firing. Get ready!" The CI repeats the scenario until every soldier has performed each task once.	

T I M E	ACTION	REMARKS
47-68	Contain an enemy attack launched from a higher/ lower floor The CI describes the scenario: Rflmn 1 and 2 in position there. Mission: ... Suddenly the squad leader comes up and orders: "Enemy has gotten into the...floor. Contain him there! Watch out for hand grenades, fire immediately!" The soldiers lob the hand grenades back, or take cover, or lie flat on the floor. Immediately after the explosion, they will fire in the direction of the attacking enemy.	2 soldiers employed as aggressors are trying to get to another floor.
68-90	Counterattack and eliminate the enemy The squad leader orders: "You rflmn 1, pick your position on the left of the stairs, I'll be on the right of the stairs. When I give you the signal, you, rflmn 1, will lob up a hand grenade. After the explosion, I'll rush up firing bursts and then you, rflmn 1, and then you, rflmn 2, will follow, both without firing. Get ready!" The CI rotates the soldiers until every one of them has been employed in each function.	Wherever possible, attack the enemy with ruses where he does not expect you.

Combat Arms School 1
School Staff Org Off
City/Forest Fighting

Hammelburg, May 1981

Training Field:	Military Operations on Urbanized Terrain (MOUT)
Training Subject:	Attack in a built-up area
Section:	Advance along streets
Training Objectives:	The soldier should be familiar with one organization for advancing along streets, should use all available cover and concentrate his observation on areas which the enemy might use as positions, and react swiftly in case of danger. Beyond that, he should also learn how to advance together with APCs/IVFs, to maintain contact with hem, to protect them against enemy antitank weapons and to exploit their firepower.
Training Form/Procedure:	Practical duty/station training
Regulations:	ZDv 3/11, No 2159-2165, (FM 90-10, Appendix G, ST 90-10, Annex D)
Time:	90 minutes
Location:	BONNLAND, Hauptstrabe (main street) from the south to the center of the village, Schlobstrabe from the east (from the castle) to the center of the village (STATION 9)
Personnel:	1 platoon per location
Responsibility:	Platoon/Squad leader
Materials:	1 megaphone 4 armbands, red 500 rounds of blank ammunition (rifle)

Conduct of the Training

TIME	ACTION	REMARKS
0-1	The Chief Instructor (CI) describes - the training subject - the training objective	
1-6	The CI describes the scenario: "Our company is attacking on both sides of this street to the north (west) and has captured the enemy positions in the center of the village. The 1st platoon which has been following in column, has just reached the southern (eastern) edge of the village. The following order comes in on the radio: "1st platoon come up to the center of the village moving along HAUPTSTRASSE (SCHLOSSSTRASSE) in dismounted formation. Watch out for bypassed enemy soldiers on both sides of the street." Therefore the platoon leader has ordered his platoon to assume the following formation: "Front left: 1st squad Front right: 2nd squad Behind them: platoon headquarters with APCs/IFVs. (If the platoon has 3 squads, the 3rd squad will follow behind platoon headquarters). Ready for action - go!" The platoon has advanced up to there in the sequence platoon headquarters- 1st squad- 2nd squad- 3rd squad. APCs/IFVs overwatching from there (point it out). The CI has the platoon assume the movement formation.	
6-30	Assume the formation for advancing along streets Starting from platoon column, the platoon now assumes the formation ordered. The platoon sergeant and the squad leaders act as tactical leaders, the platoon leader is the chief instructor. When the formation has been assumed, the CI interrupts the sequence and explains the formation. The CI has this phase repeated before allowing the platoon to advance. The soldiers move in hip firing position. They use all cover available along the street, but keep in mind that these spots might be mined. They advance close to the buildings and observe the houses on the opposite side of the street. They especially eyeball these spots which might serve a positions for enemy soldiers. The first soldier in every squad column observes to the front, the last one to the rear. The rifles must always be pointed in the direction of observation. The squads avoid bunching up and standing around without cover. The APCs/IFVs overwatch from hull down positions if available and leapfrog forward.	1st run

Conduct of the Training

T I M E	ACTION	REMARKS
30-60	Action when enemy contact is made The CI employs 2-3 aggressors so that every squad will be fired at. Booby traps and aggressors appearing and firing out of the sewer system surprisingly should give every soldier a vivid impression of the peculari-ties of urban combat. The soldiers return the fire immediately and eliminate the enemy. The sequence is as follows: - fire immediately in the direction where the shot came from. Frequently it will not be possible to identify the enemy position at once. - locate the enemy - destroy the enemy - carry on. The enemy soldiers who cannot be engaged by the advancing soldiers or only with a high consumption of ammunition and time will be destroyed by the APCs/IVIs.	2nd run Use trip flares!
60-85	Repeat the scenario.	3rd run
85-90	Debriefing	

Left side —
leave blank

APPENDIX G

MOUT TRAINING IN GREAT BRITAIN

The training budget available to United Kingdom Forces is limited when compared with that of the U.S. Army. It is significant to note, therefore, the training emphasis placed on Fighting In Built-Up Areas (FIBUA) found within the British Army. Observations of four training facilities in England, largely oriented to security forces preparation for duty tours in Northern Ireland, revealed substantial effort to identify low-cost and imaginative solutions to training problems.

Cinque Ports Training Area

A visit to the Cinque Ports Training Area in Hythe allowed observation of a concentrated facility of ranges devoted to live fire training for FIBUA activities. Three major ranges are available, all with constant closed-circuit television coverage, to train marksmanship and clearing movement skills in an urban environment. These skills would be directly relevant to missions to clear buildings in similar European towns. Soldiers train for one week at the Cinque Ports Training Area, dividing their time between the three primary facilities.

The first range simulates a small town, with scenarios developed to expose soldiers to problems typically faced in small team movements. Closed-circuit television monitoring permits controllers to develop scenarios which tax the ability of each team (three or four men) to survive the exercise. An example of this training was observed on television replay. Each team receives classroom training before coming to the training site and again during a briefing before entering the range/town area. A mission is given to the team leader to move through the town and clear a specific building where a known terrorist is believed to be staying. The team takes time to prepare its plan for conducting the operation; they check their equipment and move from the briefing room to the streets. A distance of approximately one city block is allowed to establish the pattern of movement before the team is exposed to problems enroute to their objective. Silhouette targets can pop out of doorways to the front, side, or rear of the team. The soldier seeing the target must identify the exposed target as hostile before engaging it. Engagement provides an opportunity for the controllers to expose another target, definitely hostile, while the team members are distracted. This can create confusion and potentially cause a simulated casualty on the team. At this point, if a casualty occurs, a second team which sometimes has an ambulance, must enter the problem area to extract the injured man. The controllers can, at this point, increase the problem complexity with simulated sniper fire against the rescue team. Scenarios are planned in general; however, the controllers are experienced enough to develop opportunities for stress even in the most prepared teams. While plastic ammunition is used for safety and to limit the damage incurred to the structures in the town, this ammunition is considered dangerous out to 100 meters.

The second range at the Cinque Ports facility trained target discrimination under live fire conditions. Team members engaged targets from firing positions inside a building which faced three streets with masked overhead trolley tracks, which supported and moved three-dimensional targets about the streets. Initially, team members had to establish individual sectors of responsibility and practice engaging identifiable hostile targets. Subsequent exercises exposed hostile targets in proximity to innocent civilian targets and in some cases allowed enough time for a firer to identify, aim, and as he was about to fire, mask the hostile target with a child. Again controllers had the flexibility to make the exercise as difficult as the firers could complete, and more so.

The third range was built in an abandoned coastal fortress which had previously served as an artillery post. Built in-the-round, this range allows firers to engage targets exposed in windows across a 50-meter courtyard. It also permits return live fire. Firing ports in proximity to the targets had small arms in fixed firing positions aimed to fire close to friendly firers. Bullet traps on the firers' side of the range absorbed the incoming fire and gave the soldier an opportunity to experience hostile fire while engaging targets. Soldiers with whom we spoke were enthusiastic about the importance of such an experience. They reported confidence that they would be less likely to "freeze" in a hostile fire situation as a result of this training.

The Cinque Ports Training Area, with these three major ranges and 30 additional small arms marksmanship training ranges, represented the most elaborate facility observed during the visit to England. The use of special concrete (Slabcon), which eliminated the danger of ricocheting rounds, combined with the use of plastic ammunition permitted effective live fire training under reasonably safe conditions. The effective use of safely secured hostile weapons allowed each soldier to experience incoming small arms fire during his training at Cinque Ports. What was most important about this training was the skill of the training cadre and their ability to capitalize on any situation which developed on the ranges. The cadre possessed years of experience in training and facility maintainance and this experience was effectively used.

An advantage that the British have over U.S. Army trainers is the continuity of their training staffs. The controllers at the Cinque Ports Training Area are retired military trainers, and civilian trainers, who have been stationed at the facility for years. The expertise of military personnel is not lost through routine rotation of duty posting. Observations made throughout the British visit revealed that stabilization of personnel, where it was advantageous to training, was practiced. Cinque Ports had an active duty LTC as Commandant, but visits to other training sites showed that retired officers were often retained as Commandants for continuity.

Longmoor Intermediate Training Area

Longmoor Intermediate Training Area was the second major FIBUA training facility visited in England. Longmoor had been an active military facility that was closed and its housing was to become public. According to the

facility Commandant, it was recognized that the facility could be used for extensive FIBUA training and could be maintained relatively inexpensively by a small maintenance staff. The training area consists of a Security Forces Center, which was constructed to represent the British compounds found in Northern Ireland. This center was built adjacent to a housing area containing a total of 70 dwellings. All are two-story buildings of brick construction, with utilities available in approximately one third of them. Units coming to Longmoor for training bring some of their families with them to occupy those quarters having utilities. This area also has a functional corner grocery, post office and pub designed to match those found in Northern Ireland. The families, and many of the soldiers not actively training for security force duty during their two week stay at Longmoor, act as Irish civilians. This adds significant realism to the training. Search and population interaction skills are trained in preparation for security force duties in Northern Ireland.

Two thirds of the dwellings at Longmoor are set aside for conventional FIBUA training. Visiting units spend one week practicing house clearing, defense and attack, and associated skills. Usually soldiers are provided an opportunity to build defensive positions in one of the houses after viewing an example prepared by the facility cadre. The most important lesson to be learned from this construction is the amount of time and effort required to adequately prepare a dwelling for defense. It was estimated that a platoon would need three days to prepare a squad defensive position in this environment. Individual skills are practiced as well as team and squad level exercises. The facility can adequately service battalion FIBUA exercises with two companies attacking and one defending.

Another significant use of Longmoor is its support of Territorial Army (TA) training. The TA forces are somewhat similar to the U.S. Army National Guard component. According to training cadre members, consideration is being given to train British TA forces to act as defenders in the European setting in time of war. Their only mission in Europe would be to occupy key towns and villages and to defend as light infantry. This specialized mission would allow them to be trained specifically for this purpose and permit more concentrated training in the limited time they have available. TA units currently training at Longmoor limit the scope of their weekend training and train successive tasks on successive weekends.

Defence Operational Analysis Establishment

The Defence Operational Analysis Establishment (DOAE) of the Ministry of Defence is conducting a systematic study of close combat in built-up areas (Wood, Rowland, & Thody, 1982). As part of its pilot study, DOAE built a mock-up of a single story house within a large storage building. There are no ceilings in the house and an observation gantry is available above the structure to allow filming and performance measurement. Furnishings that might be expected in an actual house, as well as defensive improvements, are available for use by typical troop players during opposing force scenarios. A variety of defensive and clearing tactics can be attempted, recorded, and analyzed to identify potential improvements in general training techniques.

Once the study group is familiar with the typical performance of troops brought in to conduct clearing operations, they will be able to forecast personnel and materiel costs to clear similar structures in combat.

The British appear to begin with this approach to model-building, building an experimental data base, while U.S. Army operational analysis organizations seem to move more quickly and directly to computer-based modeling. Americans tend to develop loss ratios based on computer models while the British develop loss ratios using a series of typical units, not test troop units. Once the DOAE is comfortable with the empirical data that has been developed, it is incorporated into computer models. The approach which uses empirically based models is more realistic in that training effectiveness can vary over time and variations can be predicted. Taking typically trained troops at the time of the study provides a more representative performance factor for use in subsequent computer analysis. The performance is actual rather than projected. History tends to show that there are few common scenarios. The shortcoming of this approach to model building, however, is that it is time consuming and may not be any more appropriate for generalization than some computer generated performance factors. It must be kept in mind that the British have a smaller force to train and to analyze. The structure of the British Army also allows senior officers to be more familiar with the performance and personalities of their units than U.S. Army officers can be with theirs.

School of Infantry, Warminster

The last major training site visited in England was the School of Infantry at Warminster. In addition to a security forces center and a series of two-story dwellings, an abandoned brick farmhouse has been prepared for optimum defense by cadre at the School of Infantry. All techniques commonly presented at U.S. Army training sites and in U.S. MOUT doctrine were used in this example of structural preparation for defense. A number of techniques not presented in U.S. Army training documents were used as well (see following paragraph). The house represented an example of what might be accomplished with unlimited time and resources for preparation. It was similar in this respect to examples prepared in Greifenstein castle, at the West German Bonnland facility. Cadre take junior officers on a tour of the entire house, showing how defensive construction was accomplished and explaining the effort and time required for such construction. The officers are provided an opportunity to begin similar construction, such as sand bagging a room. After a few hours, it becomes apparent to the officers the incredible effort such fortification requires. This practice provides them with first-hand knowledge to assist them in deciding how much time to spend fortifying a structure when enemy contact is expected.

The fortified house provided some items for consideration by U.S. Army MOUT planners. Along with passage holes between rooms for escape during defense, plastic drain pipes were positioned within sandbag reinforcements to allow soldiers to fire unobserved into just vacated rooms. These channels

for fire permitted surprise fire on enemy soldiers who were pursuing retreating friendly troops. Mirrors, which would commonly be found in bathrooms, were placed at the end of crawl tunnels to surprise enemy troops pursuing friendly soldiers. By erroneously engaging the mirror, the enemy firer warns friendlies of the pursuit without exposing the soldiers to risk. At this point, the drain pipe firing ports into rooms and tunnels would be used with minimum risk.

A major consideration within the British doctrinal community is the use of built-up structures in defense. A commonly accepted philosophy of both the British and the West German forces is that only snipers and observers move above the first floor in urban and rural structures. It is assumed that indirect fire, which normally preceeds Soviet assaults, will destroy the majority of structures and all personnel within, particularly those above ground and basement floors. Consideration needs to be given to using structures for cover only and to plan fighting positions away from structural targets. Once an enemy is within direct fire range, buildings become natural targets for intensive fire. Given the time and effort it would take to adequately prepare structures to withstand such fire, it is worthwhile considering fortification preparation close to, but not in, such targeted structures. It was noted that it might be more reasonable to construct defensive positions in hedgerows and in rubbled walls, which allow better escape routes and capitalize on thick earth to provide protection from direct fire. FIBUA doctrine presently receives extensive discussion within British training and development circles.